Ballville Dam Project

Final Supplemental Environmental Impact Statement (SEIS):

Appendix A – Memoranda and Communication

1 – Letter from the City of Fremont Regarding Excavation and Beneficial Reuse

CITY OF FREMONT
OFFICE OF THE ENGINEER

September 16, 2016

Brian Elkington
Program Supervisor
U.S. Fish and Wildlife Service - Midwest Region
5600 American Blvd W. Suite 990
Bloomington, MN 55437

Re: Ballville Dam Project – Sediment Evaluation Letter

Dear Mr. Elkington,

The City of Fremont is writing this letter regarding the evaluation of potential options to remove sediment from above the Ballville Dam. As you know, the Sierra Club has presented an opinion that the sediment above the dam should be removed before the removal of the dam such that it does not get released downstream. The Sierra Club has also stated they believe the sediment could be removed, transported to a local soil processing facility and ultimately sold for a net profit. The assumption is that there is a market for the product and the cost of the sold product would be approximately $20 per cubic yard. The City met with the Sierra Club and their attorney to discuss their thoughts, listen to ideas and then evaluate potential options. From my understanding, your office also had a meeting with the Sierra Club and their attorney to discuss the same.

In the evaluation process, the City worked with MWH constructors to discuss potential removal options and logistics that would be necessary to perform the work. In doing so, it was determined that the most feasible option would be to perform the notch, dewater a large portion of the impoundment and then vegetate the exposed sediment to stabilize it. The following fall, the remainder of the dam would be removed and the water elevation drawn down exposing the remaining sediment in the impoundment area. After the remaining sediment being exposed had some time to de-water and dry in an attempt to allow it to consolidate and firm up as much as possible, specialized equipment would be brought in to remove and regrade the sediment as best as possible.

Based on what is known regarding the location and extents of the sediment, it is believed that during the initial and final stages of the dam removal, approximately 200,000 cubic yards of sediment would be transported downstream as a result of the removal of the

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Dam. This estimate is highly dependent of the flows through the river. After the final stage of removal of the dam, the river flow is anticipated to re-establish the pre-dam river channel which is anticipated to wash approximately 100,000 cubic yards of sediment downstream.

The City worked with Stantec, who is the design engineer for the project, to develop a plan for potential sediment removal while still leaving enough sediment in place to allow the required wetlands for the project to form. This evaluation indicated that approximately 200,000 to 300,000 cubic yards of remaining sediment could be removed from the impoundment area. Again the variability is highly dependent upon river flows and the amount of sediment that may remain in place.

The City then worked with MWH Constructors to develop a plan to consider sediment removal. The anticipated condition of the sediment after the de-watering and drying is expected to still have a high moisture content, be soft and unstable. The top of the exposed sediment will most likely develop a harder crust, but this crust will not support the heavy loads of typical trucks and excavators. Therefore, specialized equipment would need to be utilized that have much lower contact pressures than typical equipment. Even with low contact pressure equipment, the probability of getting equipment stuck while maneuvering through the area is high, making material movement to access points difficult. Given the anticipated conditions and limited access points to the river, the costs to remove the sediment from the river are estimated to be approximately $50 per cubic yard. See attached email and information provided by MWH that was used to arrive at this unit cost.

After sediment is removed from the river, over the road trucks would then be loaded and transport the sediment to a local location with intentions for it to be processed into a useable topsoil material to be sold on the market. It is not known what the cost of processing will be at this point in time. MWH provided a trucking cost of approximately $5 per cubic yard for transportation of the material to a near-by site. Therefore, adding in the trucking costs to the project, the cost per cubic yard to remove the sediment and transport it to a local site is approximately $55 per cubic yard. The above costs do not include any engineering, permitting, material processing, dewatering or other associated costs.

The City also worked with the ODNR to explore funding options that would potentially offset the significant costs associated with sediment removal. The sources that were explored were as follows;

- The Healthy Lake Erie Fund was evaluated as a potential funding source. This funding was developed for capital projects to address sediment and nutrient loadings in the western basin of Lake Erie and beneficial reuse of dredge

materials to meet 2020 deadline for no open-lake disposal of dredge material. Through exploration of this program, it was determined that this project is not a technical fit for the criteria because it would not address Federal Navigation Channel dredging/disposal and no open lake placement of material. It was also discovered that all the funds for this source have been encumbered for the next two years and there are no more funds unless there are additional appropriations at the legislative level. It was also determined that the this project would not have a significant impact to sediment loading or water quality in the Sandusky Bay or Western Basin of Lake Erie, which would most likely not meet approval criteria for the program.

- The Great Lakes Fish and Wildlife Restoration Act (GLFWRA) was also explored as a potential funding source. This program is designed to restore and maintain self-sustaining fishery and wildlife resources, minimize the impacts of contaminants of fishery and wildlife resources, protect, maintain and restore fish and wildlife habitats, stop illegal activities that impact fish and wildlife resources, restore threatened and endangered species and protect, manage and conserve migratory birds. Based on the program criteria and discussions with the US Fish and Wildlife Service, it was determined that this project would not be considered or would score low because there are no specific contaminant related issues associated with the sediment as demonstrated by the multiple sampling and testing activities performed on the sediment. This project would also likely not meet funding criteria as there is a low risk of long-term adverse impacts associated with sediment release due to the project design.

- The Great Lakes Fishery and Ecosystem Restoration (GLFER) program was explored. This program's primary focus is restoration of fisheries habitat and related ecosystem elements through structural projects including removal of unnecessary barriers, creation of fish passage facilities, creation of soft structures (shoreline enhancement), restoration of reefs, restoration of estuaries and rapids, creation of riffle areas, and restoration and creation of wetlands. Based on the criteria of this program, it was determined that the probability of this project getting funded is low because sediment removal would not address the primary focus areas of the program, there is no component to restore reefs, riffles, estuaries or wetlands. Although there may be opportunity for wetland enhancement.

- Other funding sources that are associated with sediment removal for beneficial re-use or sediment excavation are associated with Areas of Concern (AOCs) and sediment that has a legacy contaminant burden, or with beneficial reuse of sediment associated with maintenance of federal navigation channels. Give that this project is not identified as an AOC, the sediment does not have a legacy of

contaminants associated with it and this project is not associated with dredging in a federally maintained navigation channel, these types of funds would likely not be available for the purpose of sediment removal for this project.

It should also be noted that the City has secured $2M in funding through the US Fish and Wildlife Service which expires September 2018. The current designed phasing of the dam removal includes notching the dam in fall of 2017 and then complete removal in the fall of 2018 in accordance with the parameters set in the EIS. Any delays in this schedule will result in the loss of this funding and the probability of the City securing other funding to offset this loss is not likely.

Based on the above evaluation of anticipated costs to remove sediment from the river, the City could spend an additional $11M to $16.5M plus additional costs for engineering, permitting and other fees to accomplish removal of 200,000 to 300,000 cubic yards of material respectively. These numbers are based on a cost of $55 per cubic yard. Assuming there was a market for the material and it were sold at $20 per cubic yard, there would still be a net project additional cost of approximately $7M to $10.5M, which does not consider the costs of engineering, permitting, material processing and other costs likely to be incurred. These additional costs or any costs that will add to the project or the loss of already secured funding are not affordable to the City. Especially given the position that it is the determination of the U.S Fish and Wildlife Service, Ohio Department of Natural Resources, Army Corps of Engineers and Ohio EPA that this project is deemed acceptable as designed.

Therefore it is the City's request to move forward with the finalization of the Supplemental EIS and ultimate Record of Decision from the USFWS as developed.

Please let me know if you have any questions.

Sincerely,

Tucker Fredericksen
City of Fremont Engineer

Cc: Danial R. Sanchez, City of Fremont Mayor
Ken Myers, City of Fremont Safety Service Director

Attachments;
1) MWH Constructors cost evaluation for sediment removal

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Tucker Fredericksen

From: James Salerno <James.A.Salerno@mwhglobal.com>
Sent: Friday, August 19, 2016 10:22 AM
To: 'tfredericksen@fremontohio.org'
Cc: kmyers@fremontohio.org; Bryan Canzoneri
Subject: Opinion of Probable Cost for Sediment Removal for Re-Use Ballville Dam
Attachments: Abstract_ 2014-B-1.pdf; Dredge 1.docx; Dredging Proposal of September 13_1.pdf

Tucker-

In response to your request for our opinion of the costs associated with removing the silt upstream of the Ballville Dam for re-use our estimating experience along with examination of two example projects, one water based and one land based, substantiate that this work would be cost prohibitive.

The attached document entitled Dredge 1 shows that the costs associated with dredging can generally be broken down into 3 categories: Dredging, Disposal, and Miscellaneous. Dredging generally costs $10 - $20/CY, assume $15. Disposal costs $5 - $47/CY assume $35 (on the high side due to need to dry etc. for hauling). Miscellaneous costs would include Mobilization, Engineering, Testing, Permitting, Land Acquisition for Drying, Berm Construction, Transportation, and Site Restoration. Transportation alone of the dried material would cost at least $5/CY (8CY Trucks at $80/Hr for a 30 minute round trip haul. Accounting for the other necessary costs assume $10/CY. Total cost at least $60/CY.

The water based example project included a relatively simple disposal method and no transportation beyond the disposal site and the 2013 bid results averaged ~$40/CY. The land based example project involved sediment disposal using land based methods (excavators & swamp buggies) and the excavation costs alone exceeded $50/CY.

We have assembled the information above from the combined experience of MWHC and our Parent Company, Stantec for the purpose of assisting you to make your decision without investing in a full blown project specific estimate. Please confirm that this is acceptable or advise if you want us to proceed with a more detailed estimate.

Thanks

MWH.
BUILDING A BETTER WORLD

James A Salerno
Midwest Regional Manager
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USA

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James.A.Salerno@mwhglobal.com
www.mwhglobal.com

ABSTRACT OF OFFERS - CONSTRUCTION	1. SOLICITATION NUMBER W912BU-14-B-0001	2. DATE ISSUED 22-Oct-13	DATE OPENED 18-Dec-13	PAGE 1 OF 2
4. ISSUING OFFICE US Army Corps of Engineers, Phila Wanamaker Building, Room 643 100 Penn Square East Philadelphia, PA 19107-3390	I CERTIFY that I have opened, read, and recorded on this abstract all offers received in response to this solicitation.	Name and title of Certifying Official (Type) Joseph T. Bujnowski, Chief, Contracts Branch Signature Joseph T. Bujnowski	Date Signed 12/20/13	
5. PROJECT TITLE DELAWARE RIVER MAIN CHANNEL DEEPENING open channel dredging	8. GOVERNMENT ESTIMATE (Check A, B or C and complete D, E, and F.) A. HIRED LABOR X B. REASONABLE CONTRACT C. REASONABLE CONTRACT	9. OFFERS NO.: 1 (LB) A. OFFEROR GREAT LAKES DREDGE & DOCK COMPANY LLC 2122 YORK ROAD OAK BROOK, ILLINOIS 60523 B. Bid Security (Type and Amount) BID BOND 20% C. Amendment Acknowledged YES	NO.: 2 (LB) A. OFFEROR WEEKS MARINE, INC. 304 GAILLE DR/INNSWOODS BUS PARK, COVINGTON, LA 70433 B. Bid Security (Type and Amount) BID BOND 20% C. Amendment Acknowledged YES	
6. NUMBER OF AMENDMENTS ISSUED 0001 THROUGH 0006				

7A. ITEM No.	7B. DESCRIPTION OF OFFERED ITEM	7C. EST. QUANTITY	D. UNIT	E. UNIT PRICE	F. ESTIMATED AMOUNT	E. UNIT PRICE	F. ESTIMATED AMOUNT	E. UNIT PRICE	F. ESTIMATED AMOUNT
	BASE BID:								
1	Mobilization & Demobilization	1	JOB	LS	$1,852,680.08	LS	$3,111,000.00	LS	$2,950,000.00
2	Removal & Satisfactory Disposal of Material from Station 72+574 to 90+000 and Beckett Street Terminal	409,876	C.Y.	$25.60	$10,492,825.60	$27.00	$11,066,652.00	$29.00	$11,886,404.00
	TOTAL ESTIMATED BASE BID AMOUNT:				**$12,345,505.68**		**$14,177,652.00**		**$14,836,404.00**

ABSTRACT OF OFFERS CONSTRUCTION CONTINUATION SHEET	1. SOLICITATION NUMBER W912BU-14-B-0001	PAGE 2 OF 2
	INSTRUCTIONS - Attach this form to OF 1419, Abstract of Offers - Construction, when more than 2 offers are received on a construction project. Each Continuation Sheet will accommodate 14 contract items to conform to the number of items which can be entered on the OF 1419. Use additional OF 1419's for contract items in excess of 14 and attach additional Continuation Sheets (OF 1419A) as needed.	

2. PROJECT TITLE	OFFERS (Continued)							
DELAWARE RIVER, MAIN CHANNEL DEEPENING open channel dredging CONTINUED	NO.: 3 (LB) A. OFFEROR NORFOLK DREDGING COMPANY P.O. BOX 1706 CHESAPEAKE, VA 23327 B. BID SECURITY (TYPE AND AMOUNT) BID BOND 20% C. AMENDMENT ACKNOWLEDGED YES		NO.: 4 (LB) A. OFFEROR DUTRA DREDGING COMPANY 2350 KERNER BLVD, SUITE 200 SAN RAFAEL, CA 94901-5595 B. BID SECURITY (Type and Amount) BID BOND 20% C. AMENDMENT ACKNOWLEDGED YES		NO.: 5 A. OFFEROR B. BID SECURITY (Type and Amount) C. AMENDMENT ACKNOWLEDGED		NO.: 6 A. OFFEROR B. BID SECURITY (Type and Amount) BID BOND 20% C. AMENDMENT ACKNOWLEDGED YES	
3. CONTRACT ITEMS								
A. ITEM NO.	B. ESTIMATED QUANTITY	C. UNIT	D. UNIT PRICE	E. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT		E. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT
BASE BID:										
1	1	JOB	LS	$4,910,000.00	LS	$4,050,000.00				
2	409,876	C.Y.	$30.30	$12,419,242.80	$36.00	$14,755,536.00				
TOTAL EST. BASE BID AMOUNT:				**$17,329,242.80**		**$18,805,536.00**				

NSN 6540-01-280-5502 501419-201 Prescribed by GSA-FAR (48 CFR) 53.236-1 OPTIONAL FORM 1419A (11-88)

Dredging – for open channel dredging

Parameters to be addressed to make an accurate estimate.

Use the U.S. measuring system of feet, cubic yards, etc.

1) The distance in miles from contractors yard to the project site.
2) Describe the dredge site. River, settling pond, lake, harbor, etc.
3) The length and width of the area to be dredged.
4) The depth of material to be dredged.
   a) The minimum depth.
   b) The maximum depth.
   c) The maximum distance from the water surface to the bottom of the deepest cut.
5) The number of cubic yards of material to be dredged.
6) The spoil area must be 1.3 times the cubic yards to dredge.
   a) Do you presently have a spoil area large enough to contain the material?
   b) If not, do you have a location where the spoil area can be built?
   c) List the area of the potential spoil area.
7) The maximum distance that the material must be pumped.
8) The minimum distance that the material must be pumped.
9) The elevation above sea level of the site.
10) The static head. This is the elevation difference, in feet, between the water surface where dredging will take place and the elevation where the material will be discharged.
11) Is the material all in one location, or will the dredge need to be moved from one location to another? If the dredge must be moved:
   a) List the size of each area to be dredged in length and width.
   b) List the cubic yards in each location.
   c) The distance between locations.
   d) Can the dredge float between locations or must it be transported over land?
12) Is there an area at the site to store pipe and support equipment?
   a) List size.

13) Is there an area available, to set up a large crane [100 to 500 ton] needed to launch the dredge?

a) List the size of this area.

14) Can the dredge work 24/7?

a) If not, when can it work?

15) Are there any limitations on the flow rate from the dredge?

a) If yes, what are they?

16) What is the time period to complete the work? This should be the time from a notice to proceed until the project must be completed. This information will help determine the size of the dredge that is required.

17) A description of the material, including the percent of each type. Suggested terms are, boulders, cobbles, gravel, course sand, medium sand, fine sand, stiff clay, medium clay, soft clay, dense mud and soft mud. Other descriptive terms can be: window putty, peanut butter, catsup.

a) If dredging is in a water treatment settling pond, list the type of material, lime sludge, sewerage sludge, ferric chloride, paper sludge etc.

i) Is the sludge primary sludge or secondary sludge?

18) Are blow counts available?

a) If yes, provide the blow count log sheets.

19) Has a grain size analysis been made?

a) If yes, provide the grain size log sheets.

20) Is the material hazardous?

a) If yes, describe.

21) Will dewatering be required?

Associated Costs: $10 per cubic yard to $20 per cubic yard

The cost of dredging depends on the volume of sediment removed. The cost (expressed by cubic yard) is largely influenced by the depth of the water and the distance between the excavation area and the "staging area" where sediment is transferred to trucks for removal. Another consideration is whether equipment can easily access the area to be dredged.

Associated Costs: $5 per cubic yard - on-site to $47 per cubic yard - off-site

The primary determinant of disposal costs is whether on-site disposal is an option. If on-site disposal is not available, then locating a landfill or large area to apply the spoils may prove challenging and transportation costs may increase considerably. Dredged materials will require Engineering and permitting.

Other costs to be considered:

- Mobilization
- Engineering
- Exploration
- Testing
- Permitting
- Land acquisition for drying or permanent placement
- Construction of containment berms for drying of material (if material is contaminated then special containment structures will have to be constructed)
- Site reclamation

Ballville Dam Project

Final Supplemental Environmental Impact Statement (SEIS):

Appendix A – Memoranda and Communication

2 – Follow up Information regarding Estimated Excavation Costs

Ballville Dam Removal
Class 4 Estimate for Sediment Excavation and Hauling

Mechanical Dredge to Re-Use Alternative

Item	Unit	Quantity	Unit Price	Totals	Notes
Mobilization	LS	1	$600,000.00	$600,000.00	Special Mobilization Cost for Amphibious Tracked Equipment ($200,000 ea.)
Dredge Pad Development / Restoration	AC	12	$20,000.00	$240,000.00	For Dewatering and Preparations for Haul Off-Site
Dredge Pad Water Management	AC	12	$15,000.00	$180,000.00	
Excavation using Amphibious Tracked Excavators	CY	200,000	$25.00	$5,000,000.00	Assuming 0.5 CY buckets on excavators & transport to bank
Loading	CY	200,000	$2.00	$400,000.00	Conventional Excavator
Hauling River to Dredge Pad	CY	200,000	$5.00	$1,000,000.00	Articulated Off Road Trucks
Loading	CY	200,000	$2.00	$400,000.00	Conventional Excavator
Hauling Dredge Pad to Universal Farms	CY	200,000	$5.00	$1,000,000.00	Road Trucks 30 minute round trip
Disposal	CY	200,000	$0.00	$0.00	No Cost as delivery to Re-Use site for processing & sale
			Construction Sub-Total	**$8,820,000.00**	
			Design, Permitting, and Environmental Monitoring (10%)	$0.00	Not included in this estimate
			Contingency (15%)	$1,323,000.00	
			Total Construction	**$10,143,000.00**	
Land Acquisition (Lease)	AC	12	$10,000	**$120,000.00**	**Lease for 1 year**
			Sub-Total	**$10,263,000.00**	
Other Owner's Costs (legal, admisitration)			2%	$205,260.00	
			Total Construction & Owner's Costs	**$10,468,260.00**	
			Cost per cubic yard	**$52.34**	

Ballville Dam Project

Final Supplemental Environmental Impact Statement (SEIS):

Appendix B – Public Comments

1 – Draft SEIS Comment Category Responses

Ballville Dam Project, Draft SEIS Comment Categories and Responses

Thank you to all who submitted comments on the Draft SEIS. Below we have created "Comment Categories" based on all comments received and have provided a response for each category. Please read through these categories to find responses to concerns or issues you may have raised in your comments. We have included in parentheses after each comment category the names of commenters we felt best fit under each. For transparency and completeness, all comments received have been included in full following the Comment Category Responses below. The Final EIS, Final SEIS, and associated appendices and documents can all be found at:
https://www.fws.gov/midwest/fisheries/ballville-dam.html

1. Concern that the EIS document is pre-decisional (Sierra, Sherck)
   Response: Please see sections 1.1 and 1.2 of the Final EIS and Final SEIS for further description of the process in which the Service began assessing NEPA Compliance for this project and our approach from the inclusion of partner organizations and agencies as well as scoping and inclusion of public comments to completion of the Final SEIS.

2. Specific questions regarding sediment sample processing (USEPA)
   Response:

   1) Which section of the sediment cores were used for comparison to below-dam samples, and describe why.

   Sample sites were determined by assessing the likely areas that would mobilize during dam removal and cross referencing that with previously completed depth soundings by Stantec Inc. Initially, several sample locations were to be split into two depth intervals (e.g., 0-10 feet and 10-20 feet), however refusal depths varied between a few feet and approximately 11 ft. Therefore, sediment cores were not split into sub-samples, but were homogenized as a single sample for each sample location and these homogenized samples were used for comparison to below-dam samples. Utilizing homogenized samples best reflects expected sediment mobilization and composition during release under the alternative Incremental Dam removal with installation of ice control structure (Preferred Alternative).

   2) Describe how all of the samples were prepped for analysis (i.e. cores split, homogenized, etc.)

   Ten core samples were taken within the dam impoundment area and three grab samples were taken downstream of the dam. The downstream grab sampling locations were offset slightly to obtain representative material to that upstream of the dam. Samples were extruded from the aluminum tube or Eckman sampler and notes taken on the sediment (e.g., color, texture, organic content). Representative samples from each horizon, if present, were homogenized using a stainless spoon and stainless steel bowl and placed into appropriate field containers.

3) Identify and describe contaminant results from the 10 sediment core samples taken from the impoundment and describe which sediment core sections are likely to be mobilized based on their location and depth.

As noted in response 1 (above), the cores were not kept in sections, but homogenized. It is expected that sediment from all sampling locations, with the possible exception of sample location #8, are likely to be mobilized. Sediment data analysis can be found within the Final SEIS, however, the raw data for this study can be found online at:

http://www.fws.gov/midwest/fisheries/library/Ballville-SedimentData2015.pdf

3. Can anyone guarantee sediments won't contaminate downstream? (Burke)
Response: Based on two rounds of testing completed, one published by Evans and Gottgens, 2007, and a second in 2015 (Final SEIS, Sections 4.1.2.1.3 and 4.1.2.1.4) the removal of the Ballville dam would not cause adverse environmental effects due to contaminants contained in the sediment. This is because the levels of contaminants are either below levels that would be expected to result in adverse effects, and because the levels of contaminants in the sediments in the impoundment are not significantly different than the levels of contaminants in the sediments below the dam (Final SEIS, Section 5.1.2.1).

4. Concerns over accuracy of the estimate of sediment behind the dam, some commenters noted observing aggradation within the impoundment over the last 10 years. Commenters recommend that a "neutral" engineering firm should be hired to reassess the estimate.
(Appleby, Koschinski, Sherck, Rohm)
Response: There have been two bathymetric surveys performed behind the dam since 1993. A 1993 survey by Ohio DNR and a 2011 survey by Stantec. The 2011 survey has a much higher resolution than the 1993 survey and is the most recent measurement of bathymetry available. For these reasons the Stantec volume was used to assess the potential downstream impacts of dam removal during the NEPA process.

The 1993 survey conducted by Ohio DNR, and used in the 2002 Evans study, utilized a Total Station to manually measure "*15 to 20 depth soundings from each of 19 transects*". This means that the entire survey, depth map, and subsequent volume computations are based off of only 285 to 380 points across the 89 acre impoundment. On average, this would equate to about 4 elevation measurements per acre.

By contrast, the 2011 Stantec bathymetric survey was conducted using an acoustic echosounder coupled with a global positioning system (GPS), in addition to manual depth soundings as a quality control measure. This more efficient means of surveying collects "*13-15 readings/sec*". For comparison, if only 19 cross sections were surveyed, the Stantec survey would have produced more than 12,000 depth measurements across the impoundment. When distributed

across the 89 acre impoundment, these 12,00 points would equal approximately 135 elevation measurements per acre.

In addition, it appears that the 2002 Evans study included the island upstream of the dam in its volume computations. However, the Stantec study noted that the island is covered in trees and other mature vegetation that stabilize sediment and prevent mobilization. Therefore, Stantec excluded the sediments comprising the island from its volume computations. After speaking independently with both Stantec and Dr. Evans, it is clear that their individual methodologies for incorporating the island accounts for the majority of the difference between the two surveys.

Sediment deposition and scour are a dynamic process and are subject to redistribution in any river system or reservoir. Sediments within reservoirs may be redistributed by wave action, river velocities or flood events. However, the total volume of sediments within a reservoir will continue to accumulate until it no longer has the capacity to trap sediments. Therefore, the older the reservoir, the less sediments it is capable of trapping. At 100 years old the Ballville reservoir has likely surpassed its trapping capacity as both the Evans and Stantec studies suggest.

Both surveys were completed by qualified individuals and having spoken with both Stantec and Dr. Evans, we have confidence that both were accurate based on the data they collected respectively. Through those conversations, as described above, a reasonable explanation of the change in total estimated quantity has been provided and agreed to by Stantec Inc. and Dr. Evans. Based on this, Stantec is a more informative estimate relating to the Ballville Dam Project and we will continue to use that to inform our environmental analysis.

5. <u>The impounded sediment should be dredged first.</u> (Grob, Form Letter, Collins, Sierra Club, Michles)
   Response: As noted in other comment responses here as well as in the Final SEIS, Final EIS, and associated appendices, the analysis completed indicates no long term negative impacts due to release of sediments either through contaminant loading, nutrient loading, or direct physical impacts of sediment moving downstream.

   Sediment dredging was considered as an alternative in the NEPA process but determined not to be the best approach overall to meet the purpose and need of the project while concurrently reducing environmental impacts. Therefore, any further assessment of costs associated with alternatives not fully analyzed, including dredging or excavation of sediments are not in-line with the analysis completed and are unnecessary as a means to reduce already limited environmental impacts.

6. <u>The SEIS Fails to assess the proposed bypass/excavation alternative. (Sierra Club)</u>
   Response: As noted in other comment responses here, as well as in the Final SEIS, Final EIS, and associated appendices, the analysis completed indicates no long term negative impacts due to release of sediments either through contaminant loading, nutrient loading, or direct physical impacts of sediment moving downstream.

Bypass and excavation was considered as an alternative in the NEPA process but determined not to be the best approach overall to meet the purpose and need of the project while concurrently reducing environmental impacts. Therefore, any further assessment of costs associated with alternatives not fully analyzed, including dredging or excavation of sediments are not in-line with the analysis completed and are unnecessary as a means to reduce already limited environmental impacts.

7. Failure to consider beneficial reuse of the sediment and response to EPA comments on the EIS. (Sierra Club)
   Response: The Service has worked with EPA throughout this NEPA process on a number of topics, including responding to their comments in detail. We will continue to do so and ensure their concerns are reviewed and addressed, as we have for all comments received. For concerns regarding pre-decision through this process please refer to Comment Category 1 within this document and for questions regarding dredge cost estimates please refer to Comment Category 8.

   As noted in other comment responses here as well as in the Final EIS, Final SEIS, and associated appendices, the analysis completed indicates no long term negative impacts due to release of sediments either through contaminant loading, nutrient loading, or direct physical impacts of sediment moving downstream. Therefore, any further assessment of costs associated with alternatives not fully analyzed, including dredging or excavation of sediments are not in-line with the analysis completed and are therefore unnecessary as a means to reduce already limited environmental impacts. The City of Fremont informed the Service that they were reviewing the potential for beneficial reuse of Ballville Dam sediment following their meeting with Sierra Club representatives in June 2016. After their review was completed the Service received a letter from the City informing us that they are not interested in beneficial reuse due to the added financial burden on the community. The details of this letter and decision are highlighted in Section 2.2.3 of the Final SEIS.

8. There is a lack of meaningful consideration on the costs of sediment removal (Sherck, Sierra Club, Collins, Chudzinski, Michles, Grob)
   Response: As noted in other comment responses here, as well as in the Final SEIS, Final EIS, and associated appendices, the analysis completed indicates no long term negative impacts due to release of sediments either through contaminant loading, nutrient loading, or direct physical impacts of sediment moving downstream.

   However, given the concerns identified regarding the Stantec cost estimates used in the EIS for dredging (EIS Appendix A2), we completed further review during the development of the Draft SEIS and the Service included a much lower estimate of $6.3 million (Final SEIS Section 2.2.1) from Evans et al. 2002. Additionally, in doing further research based on this comment, a recently published feasibility study for the removal of the Gorge Dam on the Cuyahoga River in Cuyahoga Falls, OH estimated the costs required to remove an amount of sediment similar to the Ballville Dam. Although the proposed dredging strategy for removal of sediments behind

the Gorge Dam is different than those considered for Ballville Dam sediments, the cost estimates from this project underscore the expense associated with the removal of sediments:(http://www.epa.state.oh.us/portals/35/documents/Gorge%20Dam%20Report.pdf).

- *p.i The preferred alternative costs $70 million (M), with approximately $57.5M for sediment removal/disposal and $12.5M for dam removal/disposal.*
- *p.3 The results indicated that 832,000 cubic yards of sediment are present in the Gorge Dam pool (U.S. EPA 2012)*

This nearby estimate for a similar quantity of sediment was completed independently through a separate project, agency, and contractor. The difference between the two projects is that the sediments behind the Gorge Dam are highly contaminated and taxpayers must pay the high price to have them dredged prior to dam removal. Analysis of Ballville Dam sediments show low contaminant levels and no long term negative impacts due to release of sediments. Therefore, we feel confident that the estimates of cost provided throughout this EIS process have been sufficient to develop reasonable alternatives for the Ballville Dam Project, including the determination that sediment removal is an unnecessary expense.

9. <u>Concerns regarding the total suspended solids during and post dam removal and how they might impact native species compared to the Klamath River (Sierra Club)</u>
Response: As stated in the Sierra Club June 2, 2016 letter requesting an amendment to this comment, the EIS did consider and discuss historic and post-dam removal changes to suspended sediment concentrations. As such, post-dam removal total suspended solids concentrations were modeled and estimated based on a Federal Emergency Management derived HEC-RAS model and U.S. Geological Survey sediment data for reaches below the dam. Modeling results predict very little change in sediment concentration before and after dam removal. This information is included in the main body of the Final EIS, as well as Appendix 11. In addition, post-removal empirical data of suspended solid concentrations from other dam removal projects were cited in A11.

   Appendix A11 of the Final EIS assesses the potential impact of suspended solids concentrations on water quality, mussels ('suspended sediment concentrations' – p.8-9) and fish ('Physiological stress'-p.11; 'Feeding impairment' p.12-13; 'Reduced reproductive success' – p.12-13) for known species within the lower Sandusky River. The assessment includes a mix of scientific literature including field and laboratory studies, as well as examples from other river systems, relative to the potential impacts on the species of fish and mussels that inhabit the lower Sandusky River. Tolerances to suspended solid concentrations of species not present in the Sandusky River (i.e., salmonids) and other unrelated studies were not considered in this assessment. This is due to the basic ecological needs and thresholds for species adapted to, and thriving in, the primarily cool to warm water and high turbidity Sandusky River ecosystem. Which is in contrast to species native to a cold and relatively low turbidity system in the pacific northwest, such as the Klamath River. Specifically, anadromous juvenile salmonids are not native to Lake Erie, nor do they occur in the Sandusky River due primarily to lack of cold-water habitat. Such species have a

different suite of habitat needs and tolerances than walleye or other native species to cool and warm water systems.

In addition, the systems themselves are not comparable in their mechanisms and capacity to replenish spawning habitat for their individual and different suites of native species. The substrate analysis presented in the Final SEIS (and Final EIS) demonstrate that with additional access upstream, the availability of spawning substrate will increase by 15 times current levels; supplying replacement spawning capacity, see Jones et al. citation in Final SEIS.

Numerous studies are cited throughout this section of the Final EIS and Final SEIS to document the careful consideration of the potential impacts of TSS concentrations on species in the Sandusky River. The results of this assessment concluded that impacts to aquatic biota would be minimal and short term in nature.

10. <u>The Sandusky River Total Maximum Daily Load (TMDL) will be violated by the release of the Ballville Dam sediments</u> (Sierra Club)
Response: The Final EIS, Draft SEIS, and Final SEIS discuss in detail the potential environmental impacts of sediment released through the removal of the Ballville Dam, including the impacts of nutrients into the lower Sandusky River and Sandusky Bay. The Sandusky River Total Maximum Daily Load (TMDL) is a strategy and sets standards for obtainment of water quality goals. The TMDL is developed, implemented and regulated by the Ohio Environmental Protection Agency (Ohio EPA). The Lower Sandusky River TMDL report states:

"Implementation of the TMDLs will be accomplished through the National Pollutant Discharge Elimination System program for permitted point sources and through application of best management practices (BMPs) to address agricultural and urban runoff. (p.x)"

In addition to the National Pollution Discharge Elimination System, the Ohio EPA also regulates the discharge of materials into waters of the United States; another means the Ohio EPA uses to protect water quality and meet TMDL standards.

Section 401 of the federal Clean Water Act (CWA) requires state agencies to evaluate projects that will result in the discharge of dredged or fill material into waters of the United States to determine whether the discharge will violate the State's water quality standards. Any person who wishes to place dredged or fill material into wetlands, streams or lakes must apply for an individual Section 401 certification unless the project meets the Ohio EPA conditions of applicable nationwide permits. (http://www.epa.ohio.gov/dsw/401/permitting.aspx)

Assessing the impacts of dam removal on the environment is the responsibility of the Final EIS Draft SEIS, and Final SEIS. The responsibility for assessing the impact of dam removal on established TMDLs lies with the Ohio EPA. Upon completion of the EIS in 2014, the City of

Fremont applied for a 401 permit from the Ohio EPA for removal of the Ballville Dam under the preferred alternative. The Ohio EPA approved the permit (Ohio EPA ID No 144364).

11. The Release of Ballville Dam Sediments would be a Violation of TMDL's and therefore also a Violation of the Clean Water Act (Sierra Club)
    Response: The Lower Sandusky River TMDL Implementation Plan Actions specifically identifies Dam Removal or modification as a specific restoration action in the large river assessment unit from Wolf Creek to Sandusky Bay (HUC 01400011 90 02), while Table A-7 (Appendix A) in the Lower Sandusky TMDL details the Ballville dam as a source of impairment by causing direct habitat alterations. Additionally the Lower Sandusky River TMDL identifies the stretch of the Sandusky River directly above the Ballville Dam as in non-attainment. Additional details on the Dam's impact on current conditions can be found in the Biological and Water Quality Survey of the Lower Sandusky River Basin, 2009. Sandusky and Seneca Counties, Ohio. Ohio EPA Report EAS 2011-6-9.

12. The Preferred Alternative will Violate State Water quality Standards. (Sierra Club)
    Response: The Ohio EPA is the agency responsible for determining violations of state water quality standards. The City of Fremont was granted a 401 permit (Ohio EPA ID No 144364) from the Ohio EPA to remove the Ballville Dam under the preferred alternative, stating:

    > *"Pursuant to Section 401 of the Federal Water Pollution Control Act, Public Law 95-217, I hereby certify that the above-referenced project will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Federal Water Pollution Control Act. This authorization is specifically limited to a Section 401 Water Quality Certification (hereafter referred to as "certification") with respect to water pollution and does not relieve the Certification Holder of further Certifications or Permits as may be necessary under the law. I have determined that a lowering of water quality in the Sandusky watershed (HUC 04100011) as authorized by this certification is necessary. I have made this determination based upon the consideration of all public comments, if submitted, and the technical, social, and economic considerations concerning this application and its impact on waters of the state."*

13. Concerns regarding nutrient loading and lake eutrophication under the Preferred Alternative (Sierra, Koebel, Chudzinski, Sherck, Collins, Babione, Form Letter, Michles, Koschinski)
    Response: To help the Service in writing the Draft SEIS and assess any potential impacts to the environment from nutrients within the impounded sediments, we reached out to respected academic researchers who have completed studies and published results focusing on Lake Erie and nutrient inputs in this region. These researchers were from the University of Toledo, Bowling Green State University, and The Ohio State University and were provided the previous Final EIS documents as well as data from the September 2015 sediment testing. To further investigate this topic and respond to the comments received on the Draft SEIS, we have reconnected with Dr. Chaffin and reached out to additional professors at Defiance College and Heidelberg University to ensure as clear an understanding as possible regarding nutrient loading

in relation to Ballville Dam impounded sediments and the health of the Lake Erie system. We asked each expert to objectively review the concerns identified by commenters on the Draft SEIS and offered any supporting documentation or data we had to them for their review. Below, we have included quoted statements from Dr. Kane, Professor of Biology with Defiance College, Dr. Chaffin, Senior Researcher at the Franz Theodore Stone Laboratory with The Ohio State University, and Dr. Johnson, Director of the National Center for Water Quality Research at Heidelberg University. We have included their long quoted statements so as not to misinterpret or misrepresent their responses.

Dr. Kane: "I wish to not be redundant with the comments from the other experts (Drs. McKay and Chaffin), as I agree wholeheartedly with their remarks. Instead, I wish to focus on two of the issues that the citizens/ Sierra Club have that are unfounded with respect to Ballville Dam removal.

The first issue that I would like to address is that there are abundant data to demonstrate that the Sandusky River **does not** have a large impact on the overall eutrophication issue in Lake Erie. I am NOT saying that there are not localized effects within Sandusky Bay or the associated near shore zone of the lake. In research I conducted, I found that adding in the Sandusky River Soluble Reactive Phosphorus loads to linear regressions did not add to the explanatory power that one got from just having Maumee River loads in regressions between both Total Phytoplankton and Cyanobacterial biomass (Kane et al. 2014- Journal of Great Lakes Research). In layman's terms, the Maumee River is the main driver of Cyanobacterial Harmful Algal Blooms (CHABS) in Lake Erie.

Secondly, based on morphometry and meteorology it is likely that the Sandusky subbasin (Conroy et al., unpublished data) and the Central Basin (Charlton et al.- various publications) **would go hypoxic/ anoxic even if CHABS are reduced**. Once again that is not to say that elevated levels of CHABS could not make the situation worse, but it is unlikely that we will ever be able to prevent hypoxia/anoxia throughout these basins during the summer. Further, recent research has suggested that CHABS are not as responsible for hypoxia/anoxia as much as diatoms from the winter/spring blooms that occur in the lake (Reavie et al. 2016- Journal of Great Lakes Research).

From my standpoint, removal of the Ballville Dam will only help the ecological restoration of the lake. Many dams that have more contaminants have been removed before and if dam removal is done correctly, with the appropriate safeguards, I would expect a minimal impact on the CHABS and hypoxia/anoxia in Lake Erie. Further, any impact would only be short term (another issue that the citizen/ Sierra Club comments don't address). In my expert opinion, the ecological benefits (i.e more natural flow regime, improved fish passage upstream) VASTLY outweigh any negative impacts with respect to CHABS and hypoxia/ anoxia, which would likely be temporary and localized at worst and possibly not even noticeable."

Dr. Chaffin: "...The mass of phosphorus and nitrogen in the impounded sediments has to be put in perspective to the phosphorus and nitrogen is already flowing down the Sandusky River. As I showed in my initial comments for phosphorus and here below for nitrogen, the mass of phosphorus and nitrogen in the impounded sediments is small compared to the annual phosphorus and nitrogen load from the Sandusky River.

If still concerned about phosphorus and nitrogen released from the dam removal, take the dam down in late fall after water temperatures are cool and *Planktothrix* has died back.

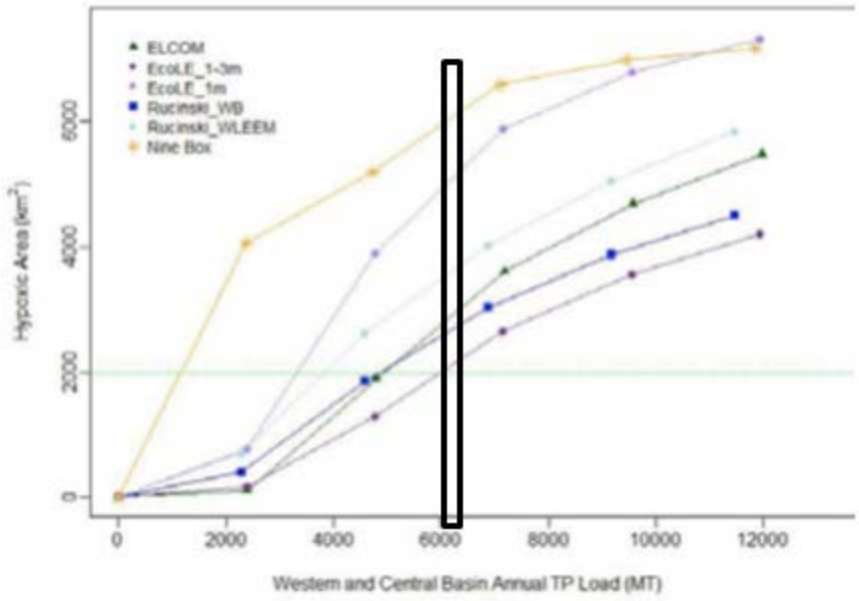
Perspective is needed here. Taken at face value, 840,000 cubic of sediments sounds like a large number but the phosphorus (208-288 metric tons P) contained in those sediments only represents about 10-20% of the annual phosphorus load from the Sandusky River to Lake Erie. The 208-288 metric tons of phosphorus released would also be a one-time event (I do not know if impounded sediment will all be flushed out at once or step-wise after each dam segment is removed) and the long-term impact will be negligible.

… [Commenters] calculate that the 840,000 cubic yards of sediments will cover 38 football fields (about 29 acres) with 10 feet of sediments. Again, perspective is needed. Sandusky Bay has an area of about 45 square miles, which is about 28,800 acres (~22,153 football fields). 840,000 cubic yards of sediment would cover Sandusky Bay with 0.22 inches layer of sediment.

… While I agree climate change is occurring and climate change will only exacerbate cyanobacterial blooms, removing the dam and climate changes are completely separate issues. Climate change will not be impacted by dam removal.

Sierra Club's comments regarding DRP and PP ratios in the impounded sediments are moot comments because the total amount of phosphorus, regardless on the DRP:PP ratio or what percentage of the PP is bioavailable, is too small to impact Lake Erie ecology.

My comments do not contradict Annex 4 report but are in line with Annex 4. Below is a load-response curve between total phosphorus load and hypoxic area in the central basin (Figure 17 from the report) and I placed a box around how much the estimated phosphorus load from dam removal would be, starting from the target of 6000 metric phosphorus per year. That box shows the total phosphorus load goal plus the total phosphorus load that is estimated from the dam removal. As you can see the release of phosphorus from dam removal would increase hypoxic area by about 100-200 km^2, which is a very small area relative to hypoxic area driven by 'normal' external phosphorus load. The conclusion would have been the same if I would have shown dissolved oxygen concentration (Figure 18 from the report).



Overall, we have to weigh the costs (hypoxic area, HABs) and benefits (fish spawning habitat) of dam removal. Both the costs and benefits of dam removal have to be relativized to what is already occurring in the present system. The slight increase of central basin hypoxic area (100-200 km^2) relative to the size of the hypoxic area already occurring (>7,000 km^2) would not affect the overall ecology of Lake Erie. In terms of HABs, *Planktothrix* blooms occur in Sandusky Bay every summer regardless of the Sandusky River phosphorus load. The mass of nitrogen in the impounded sediment is very low compared to the Sandusky load and likely in forms that are not usable for algae, cyanobacteria, or other bacteria, hence, the nitrogen released would not affect blooms in terms of biomass nor toxicity...".

Dr. Johnson: "The removal of the Ballville Dam in Fremont, Ohio appears to be an environmentally sound decision based on the evidence we have. Our region is very fortunate to have a wealth of information on the rivers that lead to Lake Erie and a good understanding of the materials behind the dam to make estimates of the possible loadings headed further downstream. The less clear estimates involve the exact dynamics of sediment movement downstream from behind the dam.

One of the primary questions at hand is how the release of phosphorus associated with the sediment or dissolved in the interstitial sediment spaces will influence the health of Lake Erie. To first tackle this question, we have to confirm where the water from the Sandusky River enters the lake. There is wide agreement that the Sandusky River, which enters Sandusky Bay, ultimately feeds into the central basin of Lake Erie. The accepted boundary for the western vs central basin are the islands that stretch between Catawba Island and Marblehead in Ohio, USA towards Point Pelee in Canada (see the Annex 4 2016 report, or Dolan et al. 2012). Often the Sandusky River watershed is included in Western Lake Erie Basin initiatives because the land use and soil types are very similar, furthermore the Sandusky River is exhibiting almost identical

long-term trends in nutrient export as the Maumee River (see Baker et al. 2014). Thus, any practices that are shown to be effective at reducing nutrient export in the Sandusky River watershed will be effective in the Maumee as well.

As of now, the Sandusky River is the second highest riverine input of nutrients to Lake Erie (Scavia et al. 2014), given the Detroit River is an interconnecting channel and where the Detroit wastewater treatment plant inputs. Calculated relative to watershed area, the Sandusky River has among the highest exports of total phosphorus and particulate phosphorus of the major rivers we monitor (excluding sub watersheds) exceeded only by tributaries that feed Grand Lake St Marys. This means that the sediment and phosphorus loading from the Ballville dam have to be exceedingly high to be significant in this river.

Although the SEIS has a good estimate of sediment and phosphorus loss from the Ballville dam, I had already made some conservative estimates of phosphorus export from the dam and arrived at very similar estimates. My calculations put total phosphorus exports at 365 – 972 metric tons, which is similar to the natural range in annual total phosphorus exports from 2011 – 2015 (352 – 938 metric tons) calculated from the Heidelberg Tributary Loading Program. To conservatively estimate dissolved phosphorus that could desorb from these sediments, I assumed that they were as rich as the agricultural soils in the basin and the desorption was equivalent to the amount of phosphorus extracted when estimating crop available phosphorus (Mehlich 3P = 36 mg/kg). From this I estimated 17 – 46 metric tons of dissolved phosphorus, which is far lower than exported from the Sandusky River over the past 5 years (ranged from 99 – 194 metric tons). When combined as total bioavailable phosphorus, acknowledging that only ~28% of particulate phosphorus is biologically available (Baker et al. 2014), I calculated 122 – 326 metric tons of total bioavailable phosphorus would be exported. This is also similar to the range in annual export from the Sandusky over the past 5 years (170 – 402 metric tons). The variation in these calculations account for the variation in the possible amount of sediment that would be exported with the highest estimates assuming 83% of the sediment behind the dam would be exported, which seems unlikely. The lower end of the estimate assumes that 54% of the sediment would be exported. Thus only if a high volume of sediment is exported within one year do the estimates of loads from the Ballville Dam become equivalent to an annual load from the Sandusky River.

Yet, Sandusky Bay is a surprisingly good filter for nutrients leaving the watershed. In a report from 1985 for measurements collected during various storm events from 1981 – 1983, concentrations of suspended sediments, total phosphorus, and dissolved reactive phosphorus leaving the bay were low even when concentrations entering the bay were quite elevated (Richards and Baker 1985). The only instance of storm plume water making it through the bay and to the lake was during a storm with a recurrence interval over 10 years. There are multiple reasons for this. First, the bay holds a substantial volume of water. Thus a typical storm serves to simply push bay water into the lake. Second, the geomorphology leads to particulate bound nutrients settling out from the storm plume. In similar studies on the Maumee River, we have found that a majority of the particulate phosphorus and suspended sediments tend to settle out

prior to leaving Maumee Bay (Baker et al. 2014). Although this seems opposite of the visual observations of riverine plumes from the Maumee, studies have found that it is very difficult to visualize the larger particulates in storm plumes because smaller clay particles dominate the color. Finally, the often dense *Planktothrix* bloom in Sandusky Bay takes up many of the soluble nutrients, although for nitrate there is evidence of high rates of denitrification that will permanently remove nitrogen from the water as a nitrogenous gas (N_2O or N_2) (Bullerjahn and McKay, personal communication). This process is driving strong nitrogen limitation of the bloom in Sandusky Bay (Davis et al. 2015), which is unlike what is observed in the greater western Lake Erie basin where phosphorus tends to be most limiting (Chaffin et al. 2014).

This suggests that existing and Ballville Dam phosphorus loads from the Sandusky River are unlikely to contribute to the *Microcystis* bloom that plagues western Lake Erie because the river doesn't enter at the western basin and most phosphorus loads won't make it out of Sandusky Bay. The phosphorus loading from the river that enters the bay is also unlikely to influence the size of the *Planktothrix* bloom in the bay as that bloom responds primarily to nitrogen availability instead.

Thus the final question at hand is whether the phosphorus loading or algal biomass from Sandusky Bay contributes to the hypoxic zone in the central basin. The hypoxic zone can be linked to the phosphorus loading entering the central basin from the western basin and from central basin rivers. The target total phosphorus load to the central basin to reduce the hypoxic zone to an average August – September hypolimnetic oxygen concentration of 2 mg/L or more is 6,000 metric tons (Annex 4, 2016). The average five-year Sandusky River total phosphorus load is 626 metrics ton, or $1/10^{th}$ of the target. Even if that loading was doubled due to the Ballville dam and we assumed all the phosphorus left the Sandusky Bay (unlikely), then the load would be $1/5^{th}$ of the target. In 2008, the total phosphorus inputs to western and central Lake Erie were 9,577 metrics tons. Thus relative to a high flow year where the likelihood of storm pulse nutrients exporting from Sandusky Bay is the highest, total phosphorus loads contributed from the Ballville Dam would be at most $1/10^{th}$ of the inputs. This level of loading, given all the reasons above, is highly unlikely.

In summary, the potential loading from the Ballville Dam, even when overestimated, would likely be a minimal contribution to Lake Erie eutrophication, Sandusky Bay eutrophication, and Lake Erie hypoxia. The economic, safety, and ecological benefits of removing the dam appear to outweigh the risk of harm from phosphorus loading".

In additional to the thoughts provided by Dr. Kane, Dr. Chaffin, and Dr. Johnson, Jeff Tyson with the Ohio Department of Natural Resources notes that through Annex 4 the parties seek a 40% reduction in annual load (from 11,000 metric tons to 6,000 metric tons annually). The proposed project, through engineering and design features, mitigates the sediment and total phosphorus release to an estimated 288 metric tons of total phosphorus over two years (144 metric tons total phosphorus/yr) which equates to 2.4% of annual loading target over a mere two year period. Following dam removal under the Preferred Alternative this action would then

effectively represent 0% of annual loading target in subsequent years. It should also be noted that the Sandusky River currently carries a large total phosphorus load over the dam annually. This will continue to be the case into the future with or without the dam in place unless there are other mitigative strategies put in place in the watershed as a whole.

In summary, we independently reached out to experts from five different universities in the State of Ohio working on nutrient loading, HAB's, and Lake Erie eutrophication issues and asked them to objectively review the available information regarding Ballville Dam and the potential impacts of the Preferred Alternative. Although each academic researcher took a slightly different approach to considering the variables and used slightly different estimates for their calculations, they all reached the same conclusion. The removal of Ballville Dam under the Preferred Alternative is not expected to have significant negative impacts on HAB's or Lake Erie eutrophication. Alternatively, in each independent response, the researchers mentioned a variety of positive benefits to the ecosystem related to completing the Preferred Alternative.

14. N:P Ratios, pathways for nitrogen versus phosphorus loss in reservoir sediments (USEPA)
Response: In their comments regarding sediment nutrients, USEPA specifically asked questions about Dr. Chaffins analysis and his approach regarding N:P ratios. To assist us in responding to these comments we asked Dr. Chaffin to review their letter and provide us with any information he felt was pertinent regarding his analysis. The Service appreciates his continued willingness to assist us in understanding this important element of the project and his response to the USEPA comments was:

"USEPA raises questions regarding bloom toxicity (a very good concern to raise) and the N:P ratios.

The impounded sediment have a phosphorus content of 757 mg/kg and a nitrogen content of 1562 mg/kg (Elkington's email, May 6, 2016) which gives a N:P ratio of 2.06 (by mass). The Redfield ratio of N:P in algae is 7.2 (by mass, 16:1 by atoms). Cyanobacteria are about 7% N (dry weight) by mass while the cyanobacterial toxin microcystin is 14% N, thus, toxin production is relatively expensive in terms of N.

I'll calculate the total mass of nitrogen in the impounded sediments and compare that to the annual Sandusky River (as I did for P in my initial analysis). The average nitrogen content of sediments above the Ballville dam was 1562 mg P/kg. This would give a total of 714 metric tons of nitrogen in the 840,000 cubic yards of sediment. 714 metric tons of nitrogen would be released and loaded to the system if 100% of the sediments were mobile. However, it is estimated that only 500,000 to 700,000 cubic yards are mobile, which results in 425 to 595 metric tons of nitrogen that could be released. The EIS reports an annual average total nitrogen load (nitrate plus TKN) of 16,164 metric tons. The estimated mass of nitrogen in the impounded sediments is only 2.6% to 3.7% that of what is already flowing down the river. Hence, the nitrogen released by dam removal will have a relatively smaller impact than the mass of phosphorus released.

It is also important to consider nitrogen form. *Planktothrix* (and other phytoplankton) can assimilate multiple forms of nitrogen, including nitrate, ammonium, and urea, to support growth and toxin production. Nitrate makes up 13,157 metric ton of the total nitrogen load from the Sandusky (EIS). However, we do not know speciation of the total nitrogen in impounded sediments, but it is known that much of the total nitrogen in sediments occurs as forms that are unavailable for biotic utilization (Wetzel, 2001).

Therefore, because much of the nitrogen in sediments is unavailable to algae and bacteria and the bioavailable component would be very small compared to the annual nitrate Sandusky River load, there will not be much, if any, stimulation of toxin production, bloom development, or N:P ratios of the bay".

15. <u>EIS fails to address the physical impacts of the proposed sediment release on the Sandusky River (Sierra Club, Form Letter)</u>
Response: Appendix 11 of the Final EIS assesses the "*Sandusky River Response to Sediment Release at Ballville Dam as a result of the Proposed Action Alternative"*. This 21 page appendix discusses in detail the potential short and long-term impacts of the Preferred Alternative on navigation, flood conveyance and capacity, water quality, and aquatic biota. Particular attention is paid in the appendix to the potentially beneficial and detrimental impacts of dam removal on spawning habitats with numerous references throughout.

The conclusions on the impacts to aquatic biota are:

- *Fish, mussels, and other aquatic organisms are adapted to short-term elevated suspended solids concentrations.*
- *Some aquatic community metrics (e.g., fish passage) recover quickly (weeks to months) from disturbances associated with dam removal while others (e.g., riparian vegetation) may require months to years to fully recover (Doyle et al. 2005).*

16. <u>Impacts of the Preferred Alternative on fishes and spawning habitat</u> (Sierra, Grob, Sherck, Michles, Koebel, Form Letter)
Response: Please review Comment Categories 9, 15, 17, 18, 19, and 21 to find responses relating to the expected impacts of the proposed phased sediment release on downstream aquatic habitats and organisms within the Sandusky River ecosystem. This information can also be found in the Final SEIS Section 5.2.2 and in the Final EIS Appendix A11.

17. <u>Concern regarding the sediment wedge in relation to flow rate in the levee area.</u> (Sierra Club)
Response: Sediment deposition downstream, associated with dam removal under the Preferred Alternative, was assessed using the standard practice of a HEC-RAS model generated by the Federal Emergency Management Agency (FEMA). Hydraulics and sediment transport were simulated under a range of streamflow and sediment loading scenarios.

    - Feasibility study 3.2: *The geometric domain for the HEC-RAS model was obtained from the previously-developed Federal Emergency Management Agency (FEMA) flood study for the project reach of the Sandusky River (FEMA model). The FEMA model was used to*

evaluate sediment transport for existing conditions, and modified to evaluate the proposed project by removing Ballville Dam from the model geometry.

- EIS Appendix A5: *Some sediment may deposit in the levee section during low flows, however, the absence of a floodplain (due to the levee confinement) greatly increases near bed shear stresses and stream power during high flows. Consequently, high flow sediment transport capacity would be expected to be very high in this part of the Sandusky River.*

As detailed in the Draft SEIS and Final SEIS, the water flows in the levee area do not slow significantly upon reaching this portion of the river due primarily to the impact of the levee and lack of floodplain available to dissipate flow velocity. Under current conditions the Sandusky River conveys large sediment loads through the lower Sandusky River (8,828,000 cubic yards from 1979-2002). If hydraulic conditions within the leveed portion of the river created conditions conducive to sediment deposition, it is likely that pronounced sediment accumulation would already be occurring within this reach. However, this area is primarily comprised of coarse grained, non-embedded substrate (current extent of gravel/cobble spawning substrate) in this portion of the river, in spite of being exposed to, on average approximately 367,000 cu yds of sediment annually. If this were an aggradation point in the river, the substrate would be embedded and the existing spawning habitat would not support the walleye and white bass fishery, and spawning grounds that it does. Expanding this idea further, the additional high quality spawning habitat upstream post dam removal would more than offset the potential short-term impacts downstream, therefore the effects of additional access could be considered positive, in some ways, in both the short-term and long-term.

18. <u>Concern regarding the sediment wedge in relation to suspended load versus bedload sediment transport mechanisms. (Sierra Club)</u>

Response: Total sediment load is comprised of two parts, suspended load and bedload. The amount and type of each transported by a river at any given time is dependent upon stream flow and the resulting hydraulic conditions affecting the velocity and turbulence within a given reach of a river. Generally, fine grained sediments are suspended in the water column while coarser grained sediments are transported as bed load, depending on streamflow conditions. The feasibility study modeled sediment transport conditions under a range of scenarios using a HEC-RAS model created by FEMA. The HEC-RAS model simulated a variety of potential impacts associated with dam removal under the Preferred Alternative and the resulting sediment transport, including sediment concentration and sediment deposition within modeled cross sections. The feasibility study did not divide the bedload and suspended sediment load fraction for each cross section and every flow condition because the primary impacts to flooding, navigation, water quality, and aquatic biota are associated with sediment concentrations and/or sediment deposition. Furthermore bedload transport and deposition of coarse grained sediments (i.e., gravel) within the spawning area would replenish and restore the integrity of this area. The results of the sediment transport modeling concluded that the substrate behind the dam likely to be transported upon removal is almost entirely comprised of fine grained sediments that will be readily suspended at high flows (Stantec 2011):

- *Most (greater than 99 percent) of the accumulated sediment in the dam impoundment is comprised of material finer than sand (diameter of less 0.25 millimeters), however, the sediment transport analyses indicate that this material will be transported downstream of the reach identified as walleye spawning habitat in the vicinity of the upstream end of the levee system, which is approximately bounded by HEC-RAS cross-section Station 82000 at its upstream end and cross-section Station 77000 at its downstream end (see Figure 18). Accumulated sediment depths in the channel invert at the end of the evaluated water years (2001, 2008) were less than 0.1 feet at Stations 82000 and 77000. This result suggests that fine-grained sediments, which comprise most of the sediment load delivered by the watershed and the material in the impoundment, are washed through the reach of the river where walleye spawning habitat has been identified.p.57*

19. Concern regarding the sediment wedge in relation to embeddedness in the fishing and spawning area. (Sierra Club)
    Response: See previous responses. Model results suggest that the vast majority of sediments stored behind the dam would be suspended and transported beyond the spawning area with very little deposition. Without deposition, there cannot be significant embeddedness within the spawning area. As noted previously, if this area was prone to deposition, the substrate would have been embedded many years ago due to the high sediment loads passing over Ballville Dam and transported through this area annually. Therefore, as long as the sediment export associated with the project is within historical ranges, as identified in the Final EIS, this stretch of river should be able to transport fine-grained sediment through, minimizing embeddedness.

20. Concern relating to Ballville Dam removal concurrent with a major storm event over the impoundment area. (Sierra Club, Form Letter)
    Response: This concern appears to reference the potential occurrence of a localized storm event producing localized sediment erosion within the impoundment following dam removal and how specifically that erosion was accounted for within the sediment transport model. Under this scenario the erosion would presumably occur directly from rainfall on exposed sediments of the former impoundment. However, erosion due to heavy rainfall is insignificant when compared to those same sediments being submerged and exposed to high flow velocities during a large flood event, such as those modeled in the Feasibility Study.

    The model simulated daily sediment transport through the lower Sandusky River for one of the wettest years on record, 2008. To mimic potential sediment contributions associated with dam removal under the Preferred Alternative, the volume of sediment was increased by factors of 2 and 10 times. What this means is that during the February 7, 2008 flood event, one of the highest flood peaks on record, the model has simulated the same event with 10 times more sediment than was delivered from the watershed on that day. For comparison, during a similar flood peak, in February of 1984, the USGS measured 124,000 tons of sediment passing downstream in a single day.

The use of the 10 times multiplier more than compensates for any potential localized erosion due to rainfall through this extreme magnification of sediment inputs in the model. Over the course of a year, the 10 times model scenario routed far more sediment through the lower river than is contained within the dam impoundment and supplied by the watershed, combined.

- *Note that the "10x" sediment loading cases result in sediment loadings at the upstream boundary of the modeled reach of the river well in excess of the amount of sediment in the dam impoundment (Stantec 2011).*

21. Concern about any disruption to the fishery as sediment moves downstream, potential economic impacts and food availability issues. (Koebel, Babione, Grob, Form Letter)
Response: Impacts to fisheries downstream have been a concern and centerpiece of this EIS process as we all attempt to understand what they potentially could or would be during and post dam removal. The cooperating agencies, using their own internal expertise and the comments received have worked to develop and assess alternatives to find one that is least impactful to the environment while still meeting the purpose and need of the project. For many reasons, after years of development, review, and consideration, Incremental Dam Removal with Ice Control Structure is the preferred alternative.

    Throughout that process, we have considered the importance of the current fishery downstream of Ballville Dam and the long term value the removal of Ballville Dam would have on the Sandusky River ecosystem, including these populations (see sections 1.3.3, 4.6.2.1, and 5.6.2.1 of the Final EIS). We also stated in section 5.7.2.2 of the Final EIS that based on other small dam removal projects which have occurred throughout the United States, the removal of the Ballville Dam is expected to have positive economic benefits as a result of improved recreational fishing and boating and enhanced property values.

    Specific to this comment, we stated in the Final EIS process that there will be some level of short term impact downstream as the sediment wedge (see comment responses 17, 18, and 19) moves downstream and out of the Sandusky River. However, it should also be noted that the species native to the lower Sandusky River are adapted to surviving and thriving in highly turbid environments (see comment response 9). These populations will likely be impacted to some extent while the sediment wedge actively moves through the system, adjusting their location to avoid the most turbid zones of the water column or habitat. However, the Sandusky River is a highly turbid system, passing on average approximately 367,000 cubic yards over the dam and through the fishing and spawning grounds each year. The aquatic biota is expected to adjust during, and immediately following, dam removal as the wedge moves through, however it is also expected to equalize and those species to continue thriving and likely begin immediately expanding their habitat range to the then newly opened habitat upstream of the former dam site.

    We have worked closely with ODNR and the City of Fremont to understand and predict how the fishery will respond to dam removal with the understanding that it is a highly valuable resource

for the Community, the State of Ohio, and the broader Lake Erie Community. ODNR's mission is to ensure a balance between wise use and protection of our natural resources for the benefit of all. Without ODNR's support of this project, we would not be moving forward.

22. Inability of walleye to migrate upstream post dam removal (Sherck)
Response: Please refer to Section B, pages 33-37 of Appendix B2 of the Final EIS for a direct response to concerns regarding the location of walleye within the Sandusky River currently and their swimming ability in relation to anticipated water velocities in the Sandusky River post removal compared to other river systems in the Great Lakes Basin. For information regarding the ICS and its potential interaction with walleye migrations please see Comment Category 24. Currently, walleye in the Sandusky River likely do not heavily use the portion of the river directly downstream of the dam due to lack of spawning substrate. Due to the dam's impact on substrate movement downstream, the stretch of river directly below the dam is devoid of suitable spawning habitat, therefore spawning aggregations of walleye typically occur downstream in areas where there is suitable spawning habitat. Historically, the stretch of river directly downstream of the dam did have some coarse grained sediment (gravel and cobble), but due to the trapping nature of the dam, and high stream power associated with the water moving over the dam, the vast majority of that coarse-grained material has been eroded and deposited downstream.

    It is also important to reiterate that the overarching purpose and need for this project go beyond the benefit of walleye. One excerpt from pages 33-37 of Appendix B notes, "There is a significant probability, although with some uncertainty, that walleye will migrate above the Ballville Dam for reproductive purposes, however, the population response may take some time. In spite of some uncertainty, we feel that the additional benefits associated with increased connectivity for other species (White Bass, Redhorse etc.), the enhanced fish community in the currently impounded section, and the potential for re-nourishment of gravel/cobble substrate in downstream spawning reaches meets purpose and need for the project".

23. Is the Ice Control Structure (ICS) needed? (Geyer, Sherck, Lamson)
Response: The Service has continued to work closely with the City of Fremont on this component of the project to clarify ICS construction and implementation. The Service is not involved with ICS installation but included it in the EIS and SEIS documents for completeness.

    Please see Appendix A5 of the Final EIS regarding the need for the ICS. In summary, from Appendix B2 of the Final EIS, "A 2008 report from the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) entitled, Impact of the Ballville Dam on Ice Jams in Fremont, Ohio, discusses ice jams in the Sandusky River in the vicinity of Ballville Dam (USACE 2008). As part of the feasibility of dam removal, the USACE CRREL Ice Engineering Group performed Ice and Hydraulic Analysis of the Dam Removal (2011a). The CRREL used the ice routine within Hydrologic Engineering Centers River Analysis System (HEC-RAS) to model current and dam-removed conditions. Twenty-eight ice jam events from 81 years of data were utilized to calibrate the model. The results indicate that the removal of the dam will have an

impact on ice jam processes in the vicinity of Fremont. Winter flood levels would likely be increased in the downtown area as the ice previously collected by the dam would be added to jams that form north of the City. According to USACE CRREL(2011a), stages downtown rose as much as 10.5 feet and increased on average from 3.5 to 7.0 feet over the 81 years modelled in the analysis. The floodwalls were high enough to protect from the majority of flood events. The USACE CRREL (2011a) concluded that "Based on this analysis, the removal of Ballville Dam will likely increase flood levels in Fremont, due to larger available ice volumes no longer retained by the dam. An ICS structure is recommended to retain that larger ice volume." The ICS was designed based on the guidance of the USACE CRREL (2011a) and is based on the best science and engineering information available".

24. ICS maintenance and log jam occurrence creating a danger to recreational users and a barrier to fish migration (Geyer, Sherck, Michles, Lamson)
    Response: The Service has continued to work closely with the City of Fremont on this component of the project to clarify ICS construction and implementation. The Service is not involved with ICS installation but included it in the EIS and SEIS documents for completeness.

    Analysis was conducted when designing the spacing on the ICS to ensure maximum flows do not exceed maximum walleye swimming speeds, however it appears the commenter is concerned about an artificial debris dam forming that would block river flows through those spaces enough to also block fish migration and cause a hazard to recreational boaters.

    Debris jams have been noted throughout the design process for the ICS and as such one specific design element is the height of the pillars, which are designed to be overtopped at certain flow rates ideally allowing debris to flow past. There is also an area on the north bank where the pillars do not extend, creating a shelf where water will be able to bypass the ICS if needed during higher flows or if a debris jam occurs which limits flow between the pillars (Final SEIS Figure 3-1).

    In addition, as part of the design of the Preferred Alternative, the access road will be maintained to the site where the ICS will be constructed. The City of Fremont has informed the Service that they are planning to use that access road to maintain the ICS and clear debris as needed. The Service would continue to defer to ODNR on water safety rules and recommended precautions when boating on State of Ohio waters.

    It is unclear the density of debris needed to create a barrier to fish migration, however, if that were to occur, aquatic biota would likely be able to use the shelf on the north side of the ICS. Additionally, either by river stages which exceed the height of the pillars or by the city manually clearing debris, it is expected that any artificial barrier would be removed allowed restored passage.

25. Hydroelectric production with fish passage or fish bypass? (Harvey)
    Response: Through the development of the EIS for this project, an alternative was fully analyzed investigating maintaining the Dam in place but still meeting the purpose and need. It highlights a

fish passage structure as a way to pass native species. However, in this case, downstream passage is also a key component for successful reproduction of many local species and survivability of aquatic biota of varying life stages over the face of the dam is unknown. Also, during development of this alternative, we did look at the potential for a nature like fishway. However, given the height of the Ballville Dam the required slope of a nature like fishway to ensure it passes all native species, there was not enough available space in the area to accommodate it. It should also be noted that Ballville Dam is considered "run of river" and has no capacity to contain and store large flow events (Final EIS, Appendix A3). Regarding Hydroelectric production at this facility, please see historic information in Section 1.3.1.2 of the Final EIS and our analysis of the eliminated "Hydroelectric Generation" alternative in Section 2.3.3 of the Final EIS.

26. Support for Dam removal (Keefe, Mosser, Spangler, Aiple)
    Response: Thank you for your comments.

27. Keep Dam as backup water supply (Babione)
    Response: Water Supply for the local community must be and is a high priority concern for the City of Fremont and by extension the cooperating agencies on this project. The cooperating agencies have worked together to understand this topic in the context of the purpose and need and possible impacts on the water intake structure for the off-channel reservoir. Please see Section 4.13 of the FEIS for a description of the affected environment and Section 5.13 of the FEIS for a description of the environmental consequences of each alternative related to water supply.

Ballville Dam Project

Final Supplemental Environmental Impact Statement (SEIS):

Appendix B – Public Comments

2 – Draft SEIS Comments Received

Ballville Dam, FW3 <ballvilledam@fws.gov>

Re: Ballville Dam Project Draft Supplemental EIS Availible

1 message

Chris Aiple [redacted] Fri, Feb 26, 2016 at 3:26 PM
To: "Ballville Dam, FW3" <ballvilledam@fws.gov>

Thank you. If they wait long enough it'll just fall down on its own.

On Fri, Feb 26, 2016 at 4:20 PM, Ballville Dam, FW3 <ballvilledam@fws.gov> wrote:

> I wanted to let you know that the Ballville Dam Project Draft Supplemental EIS is available for review at:
>
> https://www.fws.gov/midwest/fisheries/ballville-dam.html
>
> A public meeting will be take place on March 15th, 2016 from 7:00 pm – 9:00 pm at Terra State Community College, 2830 Napoleon Road, Fremont, OH 43420.
>
> Comments on the Draft Supplemental EIS must be received by April 11, 2016.
>
> Further information is available in the attached memo and at the website noted above. Thank you for your continued interest in the Ballville Dam Project.
>
> Sincerely,
>
> Brian Elkington
>
> Program Supervisor
> U.S. Fish and Wildlife Service - Midwest Region
> 5600 American Blvd W. Suite 990
> Bloomington, MN 55437
> (612) 713-5168 - Office
> (612) 713-5289 - Fax

--

Chris Aiple

[redacted]

Tom Appleby
[redacted]

April 2, 2016

Mr. Brian Elkington
US Fish and Wildlife Service, Fisheries
5600 American Boulevard West, Suite 990
Bloomington, MN 55437-1458

Re: Ballville Dam Project, SEIS Comments

I take strong exception to the conclusion reached in the SEIS that the impoundment area behind the Ballville Dam is at or nearly at equilibrium. Also, I take strong exception to the SEIS choosing Stantec's estimate of 840,000 CYs over Dr. Evan's estimate of 1.3MCYs as the best estimate.

I live on the northern shore of the impoundment area [redacted] I have lived at this address for the last 10 years. On the Southeast corner of my property there is an enormous, visible rock wedge formation that runs from my neighbor's property to my property. When I moved into my house, approximately ten years ago, 6 or 7 feet of the formation was exposed above the silt/sediment level. Now, 10 years later, only three or four feet of this formation is exposed due to the increased sedimentation in the impoundment area over the last decade. In addition, the sediment process is still continuing at the present time.

If anything, Dr. Evan's estimate would be on the low side, as 14 years of additional sedimentation has taken place since his 2002 publication. Stantec's assertion that equilibrium was reached or nearly reached in its 2011 study is totally contested by the observable, heavy sedimentation that was and is now ongoing in the impoundment area behind my property.

The one critical fact necessary to making all the important decisions concerning the phosphorus, nitrogen and sediment releases into the Sandusky River Watershed cannot be make without an accurate accounting of how much sediment is contained in the impoundment area.

The choosing of Stantec's estimate, which claimed virtual equilibrium had been reached, flies in the face of what is observable on my property. A new and thorough study of the quantity of the impoundment sediment should be undertaken at once.

How can you rely on one estimate over another when the estimates are so far apart and heavy sedimentation has continued since 2002 to the present?

Sincerely,

Tom Appleby

Ballville Dam, FW3 <ballvilledam@fws.gov>

Removal of the Ballville Dam

1 message

Babione, Sue P [redacted] Mon, Apr 11, 2016 at 8:41 AM
To: "ballvilledam@fws.gov" <ballvilledam@fws.gov>

Dear Mr. Elkington:

I have lived at [redacted] since 1995. The first time I learned of the debate about removal of the Balllville Dam was in 2000; and since that time, a constant argument has ensued about the Dam, Sandusky River fishing opportunities, fish spawning, sediment movement, composition of the sediment, ice structures, and the now-famous reservoir.

Fast forward 2016: this geographic area now has a beautiful reservoir, albeit very expensive. However, the verdict is still out on whether or not the liner will spring a leak and the source of water for filling the reservoir if the Dam is removed. The area now have two sources of water, the reservoir and the impoundment created by the Ballville Dam. That is security. Why should we mess with it? For a few more fish, that may or may not come up-stream to spawn? The $5 million that ODNR supplied toward the cost of Dam removal has accomplished nothing except cause problems. The spring walleye run, the Lake Erie fishing, and many other fishing spots along the rivers and the Bay provide abundant recreational and economic stimulation for this area. The Harmful Algal Bloom Research Initiative is a good move, with lots of work and study. Why would we create more problems by releasing more sediment that could be harmful?

Lastly: yes, the citizens of Fremont voted to remove the Dam; but most of these folks do not live on the Sandusky River and see the problems first hand. They are just tired of the arguments. They do not understand the additional problems that could be caused with Dam removal.

Thank you for taking the time to read my comments.

Yours very truly,

Sue P. Babione

[redacted]

[redacted]

[redacted]

Ballville Dam, FW3 <ballvilledam@fws.gov>

dam

1 message

lonnie j burke [redacted] Sun, Feb 28, 2016 at 6:50 AM
To: ballvilledam@fws.gov

hello brian elkingson I'm a homeowner in Fremont I live on the Sandusky river by the turnpike my concern about the dam removal is can anyone gurantee that it wont contaminate the river or the Sandusky bay or the lake if that happens it will have a catrisfic effect to all who get water from the lake if the people that say it is safe and no cemicals will flow downstream to the bay or lake them let them put up bond for say 100million if no prpblem it cost them nothihg but if it ruins river bay and lake we get money make sure that whoever say it safe to remove be held accountable if it not safe and poisons river bay and lake I think it too big of issue for anyone to rule on send to Columbus let them pay and be held accountable itwill never happen problem solved

Mr. Brian Elkington,
US Fish and Wildlife Service, Fisheries,
5600 American Boulevard West, Suite 990,
Bloomington, Mn 55437-1458

Re: Comments to the Ballville Dam SEIS

Dear Mr. Elkington:

I live on the Sandusky River above the Ballville Dam and I boat on the Sandusky River below the dam, into the Sandusky Bay and Lake Erie.

The Supplemental Environmental Impact Study has underestimated and largely ignored the problems associated with the impoundment sediment and silt release into our waterway.

The stated goal of government policy is to reduce the nutrient sediment loads entering the Sandusky River Watershed. Please explain how the release of 840,000 Cubic Yards of sediment, loaded with nitrogen and phosphorous, will help achieve stated governmental policy of reducing phosphorous, reducing nitrogen, and reducing sediment?

You know and I know the release of this material will work to worsen the situation. It will not improve it.

The river and bay cannot now be navigated in certain areas because of the sediment. The HAB outbreaks are out of control. Please amend your study, so that it is believable.

Remove the sediment before the dam is taken down.

Sincerely,

Mark Chudzinski

[redacted]

April 9, 2016

Re: Draft Supplemental Environmental Impact Statement (SEIS)
Ballville Dam Project

Dear Mr. Elkington,

I am very disappointed in the way the Environmental Impact Study concerning the Ballville Dam has been handled to this point.

I was born and raised in Fremont. I own properties both on and near the Sandusky River.

When the Sandusky River, the Sandusky Bay and Lake Erie are all showing great stress from algae blooms (some of which are caused by excess nitrogen, and some of which are caused by excess phosphorous), why are you recommending that the material behind the dam which is heavy in both phosphorous and nitrogen be released into our Sandusky River?

This material should be dredged out of there, before the dam is taken down!

Your estimates for removing the material are not serious estimates. I believe they are just made up numbers.

I have fished in the Sandusky River and I have boated in the Lake and Bay. The last thing this water system needs is an unnecessary, massive release of sediment that is loaded with fertilizer.

This environmental study is supposed to protect the environment, not harm it.

Do your job and get reasonable estimates for cleaning up the mess behind the dam, before you tear it down. Have all your participating agencies secure the grant funds to do this. Whose side are you on?

Sincerely,

Kath Collins

Kath Collins

[redacted]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

APR 11 2016

REPLY TO THE ATTENTION OF:

E-19J

Brian Elkington
U.S. Fish and Wildlife Service
5600 American Boulevard West
Bloomington, Minnesota 55437

RE: Supplemental Draft Environmental Impact Statement: Ballville Dam Project – Sandusky County, Ohio (CEQ# 20160043)

Dear Mr. Elkington:

The U.S. Environmental Protection Agency (EPA) has reviewed the U.S. Fish and Wildlife Services' (USFWS) February 2016 Supplemental Draft Environmental Impact Statement (SDEIS) for the Ballville Dam Project located in Sandusky County, Ohio. This letter provides our comments on the SDEIS, pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

EPA reviewed the original Draft EIS (DEIS) for this project and provided comments to USFWS on March 26, 2014. We rated the DEIS as **Environmental Concerns - Insufficient Information (EC-2)**. See the attached "*Summary of EPA Rating Definitions and Follow-Up Actions*" for more information. We also provided comments on the Final EIS (FEIS) on September 8, 2014. EPA's previous comments and primary recommendations have focused on wetland and water resource impacts, mitigation, water quality, endangered species, historic preservation, and sediment issues.

The FEIS selected Alternative 4 - Incremental Dam Removal with installation of an ice control structure (ICS) as the Proposed Action for providing fish passage upstream and downstream of the Ballville Dam location, restoring natural hydrologic and sediment transport regimes, and addressing dam safety and liability. The Proposed Action would be divided into three phases with each phase having multiple objectives for meeting dam removal goals. In summary, the phases are: 1) the initial notching of the Ballville Dam; 2) sediment stabilization, dam removal, and ice control structure construction; and 3) sea wall modification along the north bank of the river upstream of the dam removal, and restoration of the project area. Phase 3 would also include the demolition of any remnants of Tucker Dam[1], if necessary.

[1] The Tucker Dam was reportedly built between 1835 and 1858 and was a nine foot tall timber crib design that used water power to work a flour grist-mill. This dam and mill was reported to be operational into the early 1900's and was located within the current Ballville Dam impoundment.

The limited-scope SDEIS evaluates the environmental effects associated with new information compiled for the project regarding contaminant analysis of sediments located within the Ballville Dam's upstream impoundment on the Sandusky River. The potential impacts of the Proposed Action on downstream habitats due to sediment release is one of the concerns identified as a focus of the SDEIS. The Ballville Dam has altered natural hydrologic and sediment transport functions in the Sandusky River. Notably, the dam currently traps coarse sediment in the upper portion of the impoundment as water velocities are reduced and they are no longer carried downstream. The SDEIS builds on the previous environmental documents compiled for this project, and addresses sediment-related questions and concerns brought to light during the interim period of the publication of the project's Record of Decision (ROD) in October 2014 and the present. Additionally, the SDEIS discusses a new alternative, (Dam Removal with By-Pass Channel and Impoundment Excavation) that was created based on comments received during the FEIS comment period. This new alternative ultimately was not carried forward for further analysis in the SDEIS.

On July 7, 2015, the Sierra Club filed suit in District Court alleging that the City of Fremont (City), the USFWS, and the U.S. Army Corps of Engineers (USACE) (as the cooperating agency) failed to "*lawfully consider and mitigate the environmental harm that the release of the massive quantity of contaminated sediment that has grown behind the dam for over a century will cause downstream to the Sandusky River, Sandusky Bay and Lake Erie following the dam's removal in the manner approved in the EIS*" and, further, failed to "*lawfully consider reasonable alternatives to addressing this sediment in a more environmentally protective manner.*"

Concurrently, USACE determined that further testing of the sediments impounded by Ballville Dam would be required to complete the Clean Water Act Section 404 permitting process. USFWS determined that this additional sediment data would add significant new information that could inform their understanding of the impacts of the proposed alternative on the environment in the project area.

As such, USFWS worked closely with USACE, the Ohio Department of Natural Resources (ODNR), and the City to develop a plan to complete additional testing, reevaluate the potential impacts based on the analytical results, and incorporate this additional information into the decision making process through the completion of the SDEIS. In addition to the noted allegations, the suit detailed other concerns also related to sediment management and sediment impacts. These topics include questions regarding the estimate of total quantity of sediment impounded by Ballville Dam, the potential impacts of the proposed alternative on harmful algal blooms (HABs) in the Sandusky River and Lake Erie due to the proposed sediment release, the potential impacts of the proposed alternative on downstream habitats due to sediment release, the accuracy of cost estimates of sediment removal within the EIS, evaluation of a by-pass and excavation alternative provided in comments on the FEIS, and the potential for beneficial reuse of sediments impounded by Ballville Dam.

EPA rates the SDEIS as **Environmental Concerns - Insufficient Information (EC-2)**. This rating is based primarily on concerns relating to contaminants and nutrients from the SDEIS's sediment analysis. EPA recommends that the Supplemental Final EIS address the following comments, as follows.

SEDIMENT TESTING – NUTRIENTS

- The SDEIS ultimately concludes that the release of Ballville Dam's impounded sediments would likely not impact HABs downstream. Section 5.1.2 of the SDEIS (analysis of Environmental Consequences to water resources, including water chemistry, sediment quality, and sediment

quantity) relies on correspondence from Dr. Justin Chaffin (of Ohio State University's Franz Theodore Stone Laboratory) dated December 11, 2015, and specifically, on insights provided by him on HAB occurrence in western Lake Erie (WLE) as well as Sandusky Bay. Of note, Dr. Chaffin indicates the cyanobacteria community composition of Sandusky Bay is very different than WLE and is dominated by *Planktothrix spp*. Harmful algal blooms in Lake Erie can be attributed to six to seven species of cyanobacteria, including *Planktothrix spp.*, but *Planktothrix spp,* is of particular concern because of its abundance in recent years.

Recent work by Davis et al. 2015[2] indicated *Planktothrix spp.* bloom size and release of toxins increases with additions of nitrogen. Dr. Chaffin states in his December 11, 2015, letter that current Nitrogen to Phosphorus (N:P) ratios in "river sediments" are very low and, as such, will not stimulate cyanobacteria blooms. The SDEIS is unclear whether Dr. Chaffin considered N:P ratios in the sediment currently present 1) behind the dam within the reservoir; and 2) if different pathways of nitrogen versus phosphorus loss in reservoir sediments following drawdown were considered, possibly altering actual N:P ratios delivered to downstream waters. Specifically, if a greater proportion of nitrogen can be transported downstream during reservoir drawdown independent of sediment movement, will N:P ratios be greater than simply looking at recorded values for impounded sediment?

Finally, Davis et al. 2015 documented an increase in production of cyanobacteria toxins as nitrogen in the form of urea, NH_4, and NO_3 are added to Sandusky Bay cyanobacteria communities dominated by *Planktothrix spp*. The SDEIS is not clear if USFWS has considered that, while Sandusky Bay cyanobacteria community size may not increase significantly due to dam removal, there may be a change in cyanobacteria toxin production.

Recommendations: The SFEIS should provide additional information on the following questions/issues:

1. Clarification and additional information on whether or not Dr. Chaffin's analysis considered N:P ratios in the sediment currently present behind the dam within the reservoir;
2. Clarification and additional information on whether or not Dr. Chaffin's analysis considered different pathways of nitrogen versus phosphorus loss in reservoir sediments following drawdown, which could possibly alter actual N:P ratios delivered downstream and to receiving waterbodies;
3. A discussion and analysis of if a greater proportion of nitrogen can be transported downstream during reservoir drawdown independent of sediment movement, focusing on whether or not N:P ratios will be greater than simply looking at recorded values for the impounded sediment; and
4. A discussion and analysis of the possible effects of a potential change (increase) in cyanobacteria toxin production, based on the increase in production of cyanobacteria toxins as nitrogen in the form of urea, NH_4, and NO_3 are added to Sandusky Bay cyanobacteria communities dominated by *Planktothrix spp (*as documented in Davis et al. 2015).

[2] Davis et al. 2015 reference: http://pubs.acs.org/doi/ipdf/10.1021/acs.est.5b00799

SEDIMENT TESTING – CONTAMINANTS

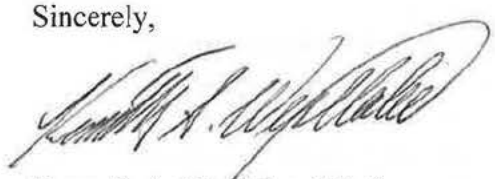
- Based on the way in which the data is presented in the SDEIS, EPA has determined that there does not appear to be a significant threat for adverse impacts from metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbon (PAHs), or pesticides. Even though some values are statistically higher above the dam compared to below the dam, all average values are below the Probable Effect Concentration (PEC) (*MacDonald et al. 2003*) and the Sediment Reference Value (*Ohio EPA 2010*). Section 4.1.2.1.4 of the SDEIS (September 2015 Sediment Sampling) references the sampling design and describes the collection of 10 sediment cores above the dam within the dam impoundment and three grab samples collected below the dam that were collected for chemical analyses.

  Recommendations: The SFEIS should include additional information as follows:

  1. The SFEIS should identify and describe which section of the sediment cores were used for comparison to below-dam samples, and describe why;
  2. The SFEIS should describe how all of the samples were prepped for analyses (i.e.; cores split, homogenized, etc.); and
  3. The SFEIS should identify and describe contaminant results from the 10 sediment core samples taken from the impoundment, and describe which sediment core sections are likely to be mobilized based on their location and depth.

EPA appreciates the opportunity to review this SDEIS. We are available to discuss our comments with you in further detail if requested. If you have any questions or comments regarding the content of this letter, please contact EPA's lead NEPA reviewer for this project, Ms. Liz Pelloso, PWS, at 312-886-7425 or via email at pelloso.elizabeth@epa.gov.

Sincerely,



Kenneth A. Westlake, Chief
NEPA Implementation Section
Office of Enforcement and Compliance Assurance

Enclosure: Summary of Rating Definitions

cc with enclosure (via email):
Jim Ellis, Mayor of Fremont, jellis@fremontohio.org
Gary Harsanye, ODNR-Engineering, gary.harsanye@dnr.state.oh.us
Becky Jenkins, ODNR-Wildlife, becky.jenkins@dnr.state.oh.us
Christina Kuchle, ODNR-Scenic Rivers, christina.kuchle@dnr.state.oh.us
Joseph Krawczyk, USACE-Buffalo District (LRB-2011-00046), joseph.w.krawczyk@usace.army.mil
Heather Allamon, OEPA-NWDO, Heather.Allamon@epa.ohio.gov
Dr. Justin Chaffin, Ohio State University, chaffin.46@osu.edu
Meaghan Kern, EPA-GLNPO, kern.meaghan@epa.gov
Kevin O'Donnell, EPA-GLNPO, odonnell.thomas@epa.gov

SUMMARY OF RATING DEFINITIONS AND FOLLOW UP ACTION

Environmental Impact of the Action

LO-Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impacts. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1-Adequate
The EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alterative and those of the alternatives reasonably available to the project or action. No further analysis or data collecting is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information
The draft EIS does not contain sufficient information for the EPA to fully assess the environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3-Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640 Policy and Procedures for the Review of the Federal Actions Impacting the Environment

Ballville Dam, FW3 <ballvilledam@fws.gov>

Please require the safe removal of Balville Dam

1 message

KnowWho Services [redacted] Wed, May 11, 2016 at 1:04 PM
To: ballvilledam@fws.gov

Dear U.S. Fish and Wildlife Service Fisheries,

The Ballville Dam is one of the oldest and largest dams in the Great Lakes, and it needs to come down, but the Sandusky River and Lake Erie should be protected in the process. I ask you to require the City of Fremont to first remove the 800,000+ cubic yards of contaminated soil before demolishing the dam.

The Sandusky River supports rare species like Bald Eagles, was second in Ohio to be designated a Scenic River, and is renown for sport fishing. Given that the river widens and slows where walleye and bass spawn, the dam removal and subsequent major rain events could dump massive amounts of soil into sensitive spawning areas, jeopardizing tourism income and supplemental food that fishing provides.

Releasing the sediment during dam deconstruction could also worsen the low oxygen levels in the Central Basin (hypoxia) or the toxic algae blooms in Lake Erie, which threaten wildlife and contaminate public beaches. US Fish and Wildlife (FWS) estimates that the sediment from behind the Dam will contribute from 215 - 288 metric tons of phosphorus pollution into Lake Erie. Given that experts are calling for a 40% reduction of phosphorous, the contaminated soil should be removed, rather than increasing annual phosphorous contamination by as much as 3%.

FWS also claims that the algae blooms in Sandusky Bay are caused by nitrogen contamination. In 2011, the City of Fremont stopped using the water behind the dam as a drinking water source, because of ongoing nitrate concerns, yet FWS completely fails to consider this risk. By choosing to ignore the impacts of the phosphorous and nitrogen while Lake Erie is rapidly dying toxic algae dead zones and low oxygen levels flies in the face of good science and good government.

Please remove the Ballville Dam, but please remove the soil first.

USFWS Note: This comment was received with minimal text variation from 1,198 commenters. It is our interpretation that the intent of the comment did not vary substantively between the variations in text. The most received version of the comment is provided here.

Dr. Richard A. Geyer
[redacted]

April 4, 2016

Brian Elkington
US Fish and Wildlife Service, Fisheries
5600 American Boulevard West, Suite 990,
Bloomington, MN 55437-1458

Re: Comments to SEIS Ballville Dam Project

I am an elected member of the Ballville Township Trustees. I am greatly concerned about the safety and maintenance of the proposed ICS structure.

I have reviewed the US Army Corp February 2015 Fact Sheet on a similar ICS placed on Cazenovia Creek, West Seneca, New York. This fact sheet can be viewed online.

The US Army Corp was taken back by the speed at which a log and debris dam forms with this type of structure. It was unanticipated. The ICS that will be placed at the Ballville site will have more pillars and be on a river that has multiple times the flow and the debris due to the massive size of the Sandusky River watershed as compared to the Cazenovia Creek watershed.

The fact sheet photo of the debris dam that formed after high water is shocking. It clearly is a deadly hazard to any kayakers or other boaters. Yet, where is the safety study on this? A study of this nature is not in the SEIS! The SEIS did a study on fish speed needed to swim by the empty pillars, but no look at safety

whatsoever when someone slams into this barrier! Yet, the FEIS touted this area as future great boating and kayaking experiences. Who in your organization will accept responsibility for the first causality? Give me that person's name, please. Is it Mr. Elkington, the Commander of the Army Corp, or the Director of the ODNR?

Ballville Township has a small volunteer fire department. Who will pay for the extra equipment, training, and personnel? Who is going to go out there to clean up this mess during times of high water in the spring when this debris dam will form? Most assuredly, it will not be Ballville Township. I hope no other local or state agency would risk the safety of its employees by having them venture out there during the springtime floods and high water.

The Army Corp is doing the clean-up at Cazenovia Creek; who will do the maintenance and clean-up here? It will not be Ballville Township.

In questions and answers submitted to the FEIS, the issue was raised as to kayaker safety caused by running into the concrete pillars. The FEIS said read the ODNR publications on boater safety! There is nothing in there about running into debris dams that block a river in the middle of a white water experience!

Thank you for considering this serious hazardous and maintenance situation.

Sincerely,

Richard A. Geyer

Richard A. Geyer

March 28, 2016

To: Brian Elkington
U.S. Fish and Wildlife Service, Fisheries
5600 American Blvd. West-Suite 990
Bloomington, MN 55437-1458

This is in response to the Supplemental Environmental Impact Study on the Ballville Dam at Fremont, Ohio.

I am 86 years old, was born in Fremont and, other than military service, have resided here all of my life.

At a very early age I was introduced to the Sandusky River when accompanying my father and grandfather for an afternoon of fishing. As I grew older, fishing the river became a regular part of my life. Later, I would introduce my wife and children to its pleasures. Then, I was instrumental in starting and carrying through the successful effort to have the river proclaimed the Sandusky State Scenic River and was appointed chairman of the advisory council which oversaw purchase and development of certain parcels along the river. At that time I also wrote and published "Down the Sandusky with Ray Grob", the only publication which traces the river from source to mouth.

I am a retired Nature photographer and outdoor media person (newspaper, magazine, radio.) During the years of my work I logged more than 3,000 miles of river travel by canoe from northern Maine to coastal Washington and from the Yukon River to central Florida. I believe I am uniquely qualified to express observations on rivers and riverine environments. My observations place me at odds with statements contained in the EIS.

It has taken 100 years for today's sediment buildup behind Ballville Dam. It may take another hundred before it is entirely flushed away (but I doubt it). Ultimately the riverbed, now buried beneath silt, will look exactly as it does at both Tindall Bridge and Ballville Bridge, namely, bare bedrock. It will be scenic and beautiful but reaching that state will cause environmental problems downstream.

Some years ago a good friend of mine tended turtle traps at Rodger Young Park (about ½ mile downstream from Ballville Dam). At that time the city opened the dam and used a fire hose to wash away silt buildup directly behind the central part of the dam. Shortly after that my friend entered the river to check his traps and sank to his knees in muck. Only with great difficulty did he escape his entrapment. That effect was created with only a fairly minor amount of released silt.

In my opinion, every year for many years, a fresh torrent of silt will be flushed downstream to inundate the valuable fish spawning beds in Fremont, degrading or destroying a historic and valuable fishery.

I believe that the only environmentally-responsible thing to do is: FIRST , remove the silt. And then, remove the dam.

Raymond G. Grob

Ballville Dam, FW3 <ballvilledam@fws.gov>

Ballville Dam Proposal

1 message

[redacted] Wed, Mar 9, 2016 at 2:52 PM

To: "Ballvilledam@fws.gov" <Ballvilledam@fws.gov>

Blayne T. Harvey

March 8, 2016

Green River College Student

Dear Mr. Elkington,

I am a natural resources student from Green River College working on a project pertaining to a proposal on environmental impacts. The proposal for the Ballville Dam is a great interest to me, even though it is not in my area. This subject is important to me because I am an avid fisherman of the species this dam is impacting and my father has worked in the hydroelectric industry for thirty years.

After read through many of the documents posted on the Internet I have seen a lot of great reasons why all of the options for the dam are a good choice. The option of restoring the dam and implementing a fish ladder interests me the most. With the dam restored comes many great benefits. This allows the fish to move upstream, a clean source of electricity, flood control, an ice control structure, and jobs for members of the community. I can see why this alternative may not be favored as well as other, because of how expensive it is compared to the other options. In my opinion this course of action causes a significantly less amount of environmental impacts. Removing the dam will cause the large amounts of silt and suspended solids in the downstream flow, which could cause flooding and high levels of turbidity. Another option rather than a fish ladder would be a fish bypass; this will be a more natural way for the fish to pass by and a lot less expensive.

Thank you for taking your time to review my comment and I hope to hear back from you about the outcome of the dam.

Sincerely,

Blayne Harvey

Elkington, Brian <brian_elkington@fws.gov>

I support the dam removal

1 message

[redacted] Mon, Mar 7, 2016 at 7:05 PM

To: Brian_Elkington@fws.gov

Brian,
I would just like to offer my support of this dam removal. I am a charter Captain at Lake Erie and feel this is an important step in restoring some more natural habit for both sauger and walleye to spawn and thrive in.
Regard's
Captain John Keefe
[redacted]

Mr. Brian Elkington,
US Fish and Wildlife Service, Fisheries,
5600 American Boulevard West, Suite 990,
Bloomington, Mn 55437-1458

Re: Supplemental Environmental Impact Study (SEIS),
Ballville Dam Project, Fremont, Ohio—my comments.

Dear Sir:

I am a Fremont City Councilman. I also am a boater, primarily in the Sandusky Bay and the northern section of the Sandusky River.

First, as a boater, I oppose the release of the impoundment material into the Sandusky River, as that massive quantity of silt and sediment will only exacerbate the difficulty in navigating portions of the bay and river which have already suffered from high sediment loads and are now nearly impossible to navigate. Second, as an environmental and health issue, few recreational boaters want to choose to spend a day cruising in the HAB slime, which during summer appears to continue to worsen from year to year. The material behind the dam is loaded with nitrogen and phosphorous nutrients that will only aggravate the situation over the coming years.

As a City Councilman, I oppose the release of the impoundment material that will cause disruption to the white bass and walleye fisheries. The best prediction is it will be "short term" meaning a few years; the worst case is the spawning beds will be permanently damaged.

Fishing is an important part of Fremont and it is an economic asset. Also, Fremont's per capita median income is only three quarters that of Ohio's median income. Because of economic necessity, some residents are known to fish, not for the sport of it, but to add food to their table. These residents cannot afford to have fishing disrupted for any length of time by the sediment release. The SEIS should at least look at this issue.

The SEIS should look again at the sediment issue and recommend it's clean-up before the dam is removed. The liability to City is too great.

Sincerely

M AKoebel

Mike Koebel, [redacted]

Gene Koschinski
[redacted]
April 5, 2016

Brian Elkington
US Fish and Wildlife Service, Fisheries
5600 American Boulevard West, Suite 990,
Bloomington, Mn 55437-1458

Re: Ballville Dam Project: My Comments to SEIS

Dear Mr. Elkington:

My wife, Linda, and I reside on the North side of the Ballville Dam impoundment area. [redacted] We have lived in this house for the last 19 years. Our lot abuts the Sandusky River, and we have a birdseye view of the river dynamics at play in this area.

The SEIS refers to Harmful Algae Blooms in the impoundment waters behind the dam. During the summer months, these HAB's are not uncommon. They erupt very quickly during conditions when the temperatures are hot and the winds calm. This is not surprising due to the high nutrient load in the massive amount of sediment material in the containment area, particularly phosphorous and nitrogen.

At times, these impoundment waters become quickly covered with bright green blooms. These HAB's are, however, quite temporary. They are of short duration because winds eventually pick up; current and ripple action begins; and, the river water moves these blooms out of that area.

The observable point that I am making here is that there is a sufficient nutrient load to cause these massive HAB's to form multiple times through the summer and early fall months. Yet, the SEIS is perfectly content to allow this potent and massive nutrient load to be released into the waterway, causing problems for the downstream area of the river and continuing to add and pile on to the existent nutrient loads in the Bay and Lake. Instead of taking measures to reduce the amount of phosphorous, nitrogen, and sediment in the system, those government agencies, charged with protecting our water and environment, have proposed a plan to do just the opposite. This is not acceptable.

Second, we utilize the impoundment area for canoeing and kayaking. The SEIS is simply wrong when it cites the Stantec study to say that the impoundment area has reached equilibrium. It has not. The impoundment area continues to gain sediment.

At low to normal water levels, portions of the impoundment area are now much more difficult to navigate, due to increased sedimentation that occurs on a yearly basis. We used to easily canoe between the "new island" and the south shore, then into the inlet that exists on the other side of the island. Sediment build up has dramatically impacted that area. For us, it is no longer accessible by canoe during low to normal water levels. Also, we have observed continuing sediment buildup along our own property line.

Therefore, since the SEIS fails to recognize that equilibrium has not been reached and sediment deposit is still an ongoing process, there is an immediate need to disregard the Stantec estimate of sediment quantity. It is unreasonable to have two estimates (Dr. Evans and Stantec on sediment quantity) so far apart, and to accept the one estimate that claims the containment area has reached equilibrium when it has not!

The SEIS needs another estimate of the current sediment amount and a thorough study of the increasing mass of that sediment. Furthermore, the SEIS needs to have accurate cost estimates for

the sediment's removal. The sediment is now contained in one place. There is now a great opportunity to help the environment, not further harm it, by releasing the sediment into the waterway.

The release of a nutrient load so powerful and massive as to cause multiple HAB's in one season, fails horribly the environmental goal of limiting Phosperous, Nitrogen, and sediment in our waterways. It does just the opposite. It pollutes our Sandusky River system.

Sincerely,

Gene Koschinski

3

Ballville Dam Project, Sandusky County, Ohio

Draft Supplemental EIS
Comment Form

The public is encouraged to provide comments on the above mentioned Draft Supplemental EIS. Comments will assist USFWS in its decision making regarding the Proposed Action and alternatives. The comment period ends April 11, 2016 and comments can be submitted by:

- U.S. mail or hand-delivery: Brian Elkington, U.S. Fish and Wildlife Service, Fisheries, 5600 American Boulevard West, Suite 990, Bloomington, MN 55437-1458
- Email: Ballvilledam@fws.gov or Brian_Elkington@fws.gov
- Fax: (612) 713-5289 (Attention: Brian Elkington)
- Submitting this comment form

Name and Address:

Walter Lamson
[redacted]

Comment:

I fail to see the need for the ice control structure. With the dam gone and the pool behind it gone there should not be any large sheets of ice flowing downstream. If your reasoning is to control ice from upstream damaging bridges there are at least eight bridges from Rt. 224 south of Tiffin to the dam that have never been taken out or damaged by ice. over

The comments that you make will become part of the public record for this project. Your thoughts will help decision-makers develop a preferred alternative. Responses to your comments will be provided in the Final Supplemental EIS. You may request at the top of your document that we withhold your personal identifying information from public review. However, we cannot guarantee that we will be able to do so.

With the debris coming from upstream that will all collect on the structure the cost of removing it will be substantial!

Mr. Brian Elkington,
US Fish and Wildlife Service, Fisheries,
5600 American Boulevard West, Suite 990,
Bloomington, Mn 55437-1458
April 9, 2016

Re: Comments to Supplemental Environmental Impact Study (SEIS) Ballville Dam Project, Fremont, Ohio

Dear Mr. Elkington:

I am a former Fremont City Councilman who has seriously questioned the wisdom of the dam removal project. I have studied government and have concluded that many public projects are born out of the righteous thoughts of well meaning people, only to later discover that unforeseen problems make the particular project impractical.

In most of those instances, good judgment prevails and the project is scuttled or modified. It is the rare case where serious problems are ignored and those promoting the endeavor move ahead, to the determent of the public good. Sadly, this is what the SEIS is authorizing, approving, and promoting in this case.

At first glance, the removal of the dam will yield great benefits such as stream connectivity and fish movement upstream. But, the SEIS allows the downsides of this project to be dodged, swept under the rug, and misstated, while the ODNR steadfastly continues to push forward the project without modification.

The SEIS cannot continue to ignore the following realities: 1) the release of the sediment will cause certain harm to the walleye and white bass fisheries in the downtown Fremont area (I was personally told by a high ranking official in the ODNR that the beds might be destroyed, but they were willing to take that risk); 2) the release of the high phosphorous and nitrogen loads in the impoundment material will adversely affect the algae problems and HAB outbreak in the water system; and 3) the sediment release will add to the difficult navigational problems in some areas of the river and bay.

At the vary least the SEIS must throw out the manufactured estimates for the impoundment material's dredging. It must explore and list the grants that are available for this clean up, and it must change its recommendation from allowing the release of this material into the watershed to removing it before the dam is taken down.

Fremont citizens will bear the cost of cleaning and maintaining the ICS structure. They cannot bear the liability of the impoundment material's release.

Sincerely,

Joe Michles,

[redacted]

Ballville Dam, FW3 <ballvilledam@fws.gov>

Comments on Draft Supplemental EIS

1 message

David Mosser [redacted] Sat, Feb 27, 2016 at 11:56 AM
To: "Ballville Dam, FW3" <ballvilledam@fws.gov>

On Feb 27, 2016, at 12:42 PM, David Mosser <davemosser@att.net> wrote:

Nothing that is trapped behind the Ballville Dam in the impoundment area, came from Fremont. Everything is either natural or industrial and agricultural runoff from upstream. I do not claim to be an expert, but very few of the detected substances were above what was already downstream. Unless there is some really big red flag issue here, I believe that the Ballville Dam removal should proceed as soon as possible. The main impediment to this project going ahead, seems to be the USACE's refusal to issue the required 404 Permit.

I believe that this project would probably already be underway, had it not been for the USACE dragging its feet to satisfy the "Save the Dam Committee", and their continued interference to suit their own personal desires. They are without a doubt the ones that drew the Sierra Club into this. I wonder how much money they contributed to the Sierra Club to get them to file this lawsuit. That would be interesting to know.

Fremont's new mayor Danny Sanchez said in the local paper recently, the he doesn't believe that this delay will increase the cost of this project. I hope that is true, but I doubt that it is. Any time that there are delays costs go up. I am glad the people of Fremont were smart enough to see through the lies by the Save the Dam folks and voted in favor of removal. It is too bad they found enough saps to sign their referendum petitions.

It is time to take the Ballville Dam down once and for all, and end this whole sad event. Shame on the people who were stupid enough to sign the referendum petition. Shame on the Save the Dam folks who misled them. Shame on the Fremont City Council members whose vote allowed the referendum in the first place. Shame on the Sierra Club for being the dupes of the Save the Dam folks. Finally shame on the USACE for refusing to issue the needed 404 Permit.

David Mosser

RANDY ROHM, PhD
[redacted]

April 2, 2016

Mr. Brian Elkington,
US Fish and Wildlife Service, Fisheries,
5600 American Boulevard West, Suite 990,
Bloomington, Mn 55437-1458

Re: Comments to the Ballville Dam
Supplemental Environmental Impact Study (SEIS)

Dear Mr. Elkington:

I have reviewed the recently filed Ballville Dam project SEIS. I am concerned about comments made in section 2.2.1 Dam Removal with Impoundment Dredging. In that section of the SEIS, the following comment is made:

"There are two estimates of total impounded sediment available. In 2002, Evans et al., used a USGS 1903, pre-dam topography map along with a 1993 bathymetric survey to estimate approximately 1.3 million cubic yards of sediments with the impoundment. In 2011, Stantec conducted a bathymetric survey and estimated a sediment quantity of 840,000 cubic yards (Stantec 2011). A full comparison of the methodologies that were used to reach these estimates can be found in Section 4.2.2.1.1. Because the 2011 survey is the highest resolution and most recent measurement of sediment volume, we conclude it is the best available estimate to use to access this alternative."

These estimates are quite far apart, 35% off to be exact. Dr. Evans's study served for years, as the environmental report on the quantity of silt in the impoundment area, prior to the scoping of the DEIS. Now his best estimate is reduced by 460,000 CYs—ironically, the same amount now estimated to be mobilized during dam removal.

Section 4.1.2.1.2. of the SEIS attempts to explain the differences in the two studies by citing the following distinguishing factors: inaccuracies of the 1903 pre-dam topography map; differences between the 1993 and 2011 bathymetric surveys on such matters as water levels and the formation of the new island, survey methodologies, short term fluctuation in sediment levels; actual sediment addition or loss and geomorphic changes during the 18 years between surveys.

These distinguishing factors "may" account for the differences, according to the SEIS. A close look at these items show that they have, however, no real value in accounting for a 35% estimate difference—a difference that is unacceptable in a

situation where short term and long term damage caused be sediment release is the major issue in the entire project. It is unacceptable when there is no chance to redo the situation once the sediment is released.

Yes, Dr. Evans relied on the USGS 1903, pre-dam topography map to more accurately determine the amount of sediment in the impoundment area. For accuracy, one would expect that it be relevant to know the contour of the basin prior to the introduction of the dam and accompanying sediment. The SEIS is now critical of the employment of this map. Implausibly, Stantec relied on the same USGS 1903 topographical map, as Dr. Evans did: "A comparison was made between the bathymetry from this survey (Stantec's 2011 survey) and estimated pre-dam topography based on the USGS 1903 topography." (Stantec: memo of May 2, 2014, Ballville Dam Project, Appendix A2).

The sediment contained in the "new island" was present when the 1993 bathymetric survey was completed; it was present in 2002 when Dr. Evan's disclosed his report; and, it was present in 2011 when Stantec conducted its survey and estimate. The "new island" was formed during the drought of 1989 and covered in trees and vegetation shortly thereafter due to the high nutrient load of the impoundment material.

If anything, differences in sediment caused by short-term floods would be irrelevant as 18 years elapsed between the bathymetric surveys.

Finally, Evans et al. (2002) "estimated that the storage capacity of the impoundment has decreased 78% due to sedimentation." (Stantec Memo, July 24, 2012, Ballville Dam Project, Appendix A3). So one could logically assume that in the nine-year interval between formal estimates, the sediment quantity would have increased rather than decreased, as there was still 12% additional holding capacity in the reservoir.

Recently, I also estimated the amount of sediment in the impoundment area behind the dam. Employing the use of a GIS system, I calculated an average width of 350.87 feet for the impoundment area, a length of 10,238 feet with a fall of 35 feet. Using Dr. Evan's impoundment capacity of 78%, I have estimated there to be 1,642,614 Cubic Yards of silt/sediment contained in the impoundment. This estimate is 26% more than Evans' estimate and a whopping 95% more than Stantec's.

For reasons contained infra, I then calculated a second estimate using the same method, but lowering the impoundment capacity from 78% to 67%. This formula yields an estimate of 1,470,997 Cubic Yards of silt/sediment. This number is very similar to Dr. Evan's estimate of approximately 1.3 M CYs—only an additional 12%.

I have had 24 years industrial experience in dealing with closed containment dynamic fluid circulation and filtration systems, aka hydromation (my PhD is in manufacturing technology). I have dealt with systems that had containments of 200 K gallons and flow rates that ranged from 60K Gal/hr to 750 K Gal/hr respectively. These systems provided necessary coolant to major industrial machines.

These systems circulate water with 3 to 5% lubricity agents. Over time, sediments accumulate in these systems just as they accumulate in the impoundment area behind the Ballville Dam. As sediment containment begins to fill, the rate of carryover also begins to rise proportionally. As containment increases, the carryover also begins to increase, and when capacity reaches 67%, you suffer a catastrophic system failure due to the sediments not only in the containment, but also in the suspension rate of the circulating water, which could be over 90%. This, in the industry, is known as the "Rule of 67".

I fully understand sedimentation that occurs in a closed water hydromation system when compared to the dynamics of sedimentation occurring behind a river dam is not an "oranges to oranges" comparison, but it is not that dissimilar as the basic nature or water and sediments are at play. So, interestingly enough when 67% is used as the impoundment sediment figure, it closely mirrors Dr. Evan's estimate.

Only two estimates concerning the quantity of the silt were ever obtained from 1993 to the present, a span of some 23 years. The last estimate was 5 years ago. Then, for the SEIS to pick Stantec's estimate for the entire project to rely on is, in my view, totally irresponsible and reckless.

Stantec's credibility has been repeatedly questioned by members of the community on this project: i.e. particularly, as to the cost of silt/sediment removal; the projected flow of the sediment and damages, be it short term or long; the debris jam that will be created by the ICS, and this, the accuracy of the total amount of the silt/sediment contained in the impoundment area.

In a project of this magnitude, where there is no agreement on the amount of silt contained in the impoundment area, how can the project proceed under these circumstances until that question has been definitively resolved? Why not request the Army Corp to provide an analysis of the quantity of the sediment behind the Ballville Dam? Why not hire a more neutral engineering firm for the sole purpose of determining the amount of impoundment sediment? Again, once the sediment is released there is no chance to recover it.

Sincerely,

Randy Rohm

3

James R. Sherck,
Attorney at Law
[redacted]
April 4, 2016

Mr. Brian Elkington,
US Fish and Wildlife Service, Fisheries,
5600 American Boulevard West, Suite 990,
Bloomington, Mn 55437-1458

Re: My Comments to Supplemental Environmental Impact Study (SEIS) Ballville Dam Project, Fremont, Ohio

Dear Mr. Elkington:

I have read the draft of the Supplemental Environmental Impact Statement, and I am extremely disillusioned in the way several topics were handled. Nevertheless, I will comment extensively on these subjects.

Also, I preface my comments with the following: I am currently an attorney and a retired judge. During the course of my legal career, which has spanned over 42 years, I have served as a judge for 23 of those years at various levels of the Ohio Judiciary, including 12 years on the State Appellate Bench and, in select cases, sitting by special substitute assignment on The Supreme Court of Ohio.

During this career, I had the task of judging the credibility of experts and witnesses. I am sorry to say that, in my view, many of the SEIS's critical areas simply lack credibility. I believe this to be a systemic condition that exists in critical areas of the SEIS and FEIS. Even though efforts, through public comment, were made to point out the lack of credibility on some of these vital topics, these labors, in my view, were ignored, not seriously considered, or misstated.

Unfortunately, the mere participation in this exercise, which to me appears to be futile, may provide a stamp of legitimacy to the proposed release of enormous amounts of phosphorous and nitrogen laden sediment into a river,

bay and lake water system, that in some areas is barely navigable and severely compromised by excessive nutrient load, resulting in serious HAB's. All of this could be avoided entirely by simply removing the sediment in the impoundment area prior to the removal of the dam.

1) The Inability of Walleye to Migrate Upstream.

"The greatest benefit of dam removal and installation of the ICS would be realized by aquatic species and particularly migratory fish." (SEIS 5-23) The SEIS goes on to extol the great benefits that will be bestowed on the Sandusky River Walleye when an additional 22 miles of upstream river use will be opened. In the opened 22 miles of river, there are areas that would be suitable to serve as new spawning beds.

The SEIS also concludes that the "ICS would not act as a barrier to fish during spawning periods." (SEIS 5-24) Based upon modeling studies, the SEIS concludes that the concrete pillars that make up the ICS, while effecting river flow, would not be a barrier to Walleye movement.

If, however, the walleye do not go near the Ballville Dam area, then the fact that suitable walleye spawning beds exist upstream of the Ballville Dam is irrelevant to any of this discussion. These beds could just as well exist in the Kalamazoo River; they would have the same inaccessibility.

There are three articulable reasons why the removal of the Ballville Dam will not change the walleye's current inability to move into the river waters upstream of the dam: 1) the ODNR's tagged walleye study, confirmed by an Ohio State study, show that Walleye are not impeded by the dam, as they do not travel that far south in the river 2) the location of the dam would be ground zero for stage five whitewater during the early Spring walleye run. This will be so due to normal spring flooding and high water 3) the ICS, during the time of the Walleye run, will have transformed itself from an open pillar structure into a "debris dam" that will effectively block fish movement.

The ODNR's seminal tagged walleye study (Eric J. Weimer, 2010, "Spawning Behavior of Lake Erie Walleye in the Sandusky River and Bay", Ohio, 2006-09) states the following at page 11 of that report: "Remarkably, it appears that river-spawning walleye do not ascend far enough upstream to be impeded by the Ballville Dam." The report goes on to say that the

farthest any Walleye was located upstream in the study was Roger Young Park some 2.5 km downstream from the dam. The report also cites The Ohio State, Thompson 2009, tagged walleye study, which confirms that no fish from either study was recorded at the Ballville Dam. Yet, the SEIS simply ignores these scientific studies and continues to promote the myth that the Walleye will use the newly opened 22 miles of river. This will be addressed further in this writer's comments: "The SEIS, A Systemic Failure to Neutrally Evaluate".

The Weimer study specifically was designed to determine "if river-spawning fish are being impeded by the Ballville Dam or if they are spawning on the first available suitable substrate" (Weimer, 2010 page 5). The latter was shown to be the case, as no tagged walleye in either the Tompson or Weimer studies was found south of Roger Young Park.

There are obvious reasons for this. The existing Walleye spawning beds end at the very beginning of Roger Young Park. Furthermore, for the Walleye to travel south, upstream from the park, the fish would encounter the rapid waters of the Sandusky River shooting out of the Ballville river ravine. The Walleye run generally begins during the last two weeks of March and pretty much ends after the first two weeks of April. This roughly coincides with the annual spring flooding of the Sandusky River.

On many occasions the Sandusky River flow has exceeded multiple billions of gallons a day during these periods. With the dam removed and heavy spring water flow, the former impoundment area would be fast moving white water, certainly in the area of stage 5 during all or significant portions of this spawning time.

So, the questions become: How the can SEIS conclude that river walleye which do not migrate further south than Roger Young park, as they are spawning in the first suitable substrate, will suddenly decide to change their behavior and venture into violent white water, when they have not done so in the past 100 years? And, then proceed to swim for four or five miles in that exceedingly fierce water flow?

Even If the SEIS can rationalize away this reality, how will the SEIS explain this: "How are the walleye to navigate these waters when, before they even reach the steep inclines of the former Ballville Dam and impoundment area,

they are blocked by the ICS pillars which have now transformed themselves into a solid "debris dam", essentially blocking fish movement?

The proposed ICS structure is essentially experimental, having been employed previously on Cazenovia Creek, in West Seneca, NY. There, the ICS, while catching the ice, also caught the river debris forming in effect a debris dam. In this case, the proverbial photo is worth a thousand words. I am directing the SEIS to review the following on line posting by the U.S. Army Corp of Engineers (that posting is also attached to these comments as Appendix A) "US. Army Corp Fact Sheet, Cazenovia Creek, Ice Control Structure (ICS)—West Seneca, NY, February 2015."

The ICS employed on Cazenovia Creek is smaller than that to be employed at the Ballville site. The Sandusky River has nearly ten times greater the watershed area and water flow rate than the Cazenovia Creek. Yet, what happened at Cazenovia was unexpected: "Volume of log and debris jams and the speed at which it amasses was unanticipated; creating conditions of turbulent overflows that scours and erodes right bank riprap revetment, the access road and the maintenance area." (Army Corp fact sheet Feb, 2015)

The photo of the resulting debris dam is appalling. How can any fish swim through a solidly packed wall of debris? Yet, the SEIS did not even look at this issue. Instead, the SEIS focused on whether the water flow around the open pillars would effect Walleye movement, going so far as to conduct a study on it! How about the SEIS doing a study on whether a solid debris wall will effect the Walleye movement? Sadly, the SEIS cannot see the forest because of the trees, or in this case, it simply chooses not to see the trees at all. Those, hundreds of trees that will be piled on top of one another creating the debris dam, stopping fish movement, and causing a hazardous condition to any boating enthusiasts or construction crews assigned to clean up the mess, are invisible in this report.

The ICS debris jam will form during spring high water periods, when the river washes itself out from the snowmelts and heavy rains of late winter and early spring. It cannot be cleaned during those spring high water periods. The very same mechanics that are at play in Cazenovia Creek are at play here—the only difference being the amount of the flow, speed of flow, and the amount of debris that washes out is multiplied many times coming down the Sandusky River.

Why did the SEIS not take a look at this facet of the ICS? Why does the SEIS still insist that the walleye will migrate upstream of the dam area in the face of all this evidence to the contrary?

2) A Failure to Meaningfully Evaluate Sediment Damage to Fremont's Greatest Aquatic Asset: the White Bass and Walleye Fisheries Located in downtown Fremont between the State Street Bridge and Hayes Avenue Bridge.

"SEIS Section 5.1.2.2 Post Construction Effects" exhibits a lack of understanding as to how the Sandusky River works in the critical river span between the Hayes Avenue Bridge and State Street Bridge—that section of the river that contains the famous walleye and white bass fisheries. The SEIS states: "The sediment wedge would not be expected to form immediately below the dam due to the small grain size of the sediment stored in the pool, as well as the relatively steep gradient of the river reach between the dam and flood control levee section. Some sediment may deposit in the levee section during low flows, however, the absence of a floodplain (due to the levee confinement) greatly increases near bed shear stresses and stream power during higher flow. Consequently, high flow sediment transport capacity would be expected to be very high in this part of the Sandusky River." (SEIS at 5-9). The SEIS then makes a general statement that the sediment wedge diminishes with distance and ultimately the river near Brady's island is susceptible to sediment aggradation, particularly the side channel.

This simplistic narrative gives the impression that the sediment wedge would not even begin to form in the area between the dam and the beginning of the levee system in Roger Young Park. It suggests that some sediment may be deposited in the levee section (Rodger Young Park to the Brady Island area, which includes the walleye spawning area) during low flows, but then implies that the stream power of high flows would effectively move the material out. The SEIS does not address the bedload portion of the sediment wedge that will scour the river's bottom and directly impact on the fisheries, by moving, rearranging, and dismantling the existing spawning bed material.

Even though the river gradient remains steep from the Ballville Dam to the area of River Cliff's Golf Course (property immediately adjacent to the start of Rodger Young Park), the sediment wedge may well be starting to form by

the time it reaches that area or even before, if the stream level is relatively low at the time the dam is breached. Once the wedge enters the area of Rodger Young Park the river clearly begins to transform itself from what was a fast current rapids just a short distance back, to the now slow meandering stream on its way to Sandusky Bay. By the time the wedge enters the area between the Hayes Avenue Bridge and the State Street Bridge (the location of the fisheries) that transformation is now complete. In that area, the riverbed is no longer a narrow gorge, but a wide, flat river plain. If fact, that whole area is so flat that it is very close to where the "lake effect" begins. That is where a strong north or northeast wind will back up water from the down steam and the bay.

In the dry seasons, it is hard to spot where exactly the water is flowing between the Hayes Avenue and State Street Bridges, as pools of water are scattered with narrow trickles of water running between them. The concept of there being no flood plain because of the levees, may be technically correct, but is grossly misleading. This is so because the width and flatness of the river plain itself serves as its own flood plain for most of the year. Only when heavy water events occur does the levee system even enter into the equation. The reality is that any sediment wedge entering this area could simply settle here and bury these beds.

The river dynamics in this area are such that strong winds out of the South and Southwest have literally blown all the water out of the flat lying area between the Hayes Avenue Bridge and the State Street Bridge—that is, walleye and white bass fisheries.

Again, a picture is worth a thousand words. Attached, as Appendix B, is a photo that I took in October 2014 showing the area between the State Street Bridge and Hayes Avenue Bridge totally exposed due to a strong wind out of the Southwest.

Will the SEIS admit that it is impossible to predict how much impact the sediment wedge (including the bedload portion of it) will have on the walleye and white bass beds?

Will the SEIS state with reasonable scientific certainty that long-term damage will not occur to these fishing beds?

The SEIS talks about the short term effects of the silt/sediment release. How many years could the existing walleye and white bass riverbeds remain buried by silt before they would be considered lost forever?

In the concluding words of Weimer 2010 Spawning Behavior of Lake Erie Walleye in the Sandusky River and Bay, Ohio the following statement is made: "It is possible that, despite having a lower relative proportion of spawning adults, the river portion of the stock may produce more viable offspring than the bay portion due to the availability of more high quality habitat" (page 13). How is it that the release of the bedload portion of the sediment wedge directly over the walleye spawning bed in the Sandusky River will keep or improve that "high quality habitat," rather than damage or destroy that "high quality habitat" talked about in the Weimer study?

3) Inadequate Considerations of the Impact the Phosphorus/Nitrogen sediment load will have in the Sandusky River, Sandusky Bay and Lake Erie Water System.

Ironically, the FEIS was released the same day in August, 2014 that 250,000 Toledo, Ohio residents lost the use of their public water supply to cyanotoxin microcystin. The microcystis blooms, which cause the toxin, are directly related to the high nutrient load of phosphorous entering the water system. The FEIS suggested that the phosphorous laden sediment contained behind the Ballville Dam would have no effect upon the HABs because that sediment for the most part was particulate phosphorous rather than readily available soluble phosphorous. This distinction was important, according to the FEIS, because it was only the readily available phosphorous that was aiding the blooms.

Now, the SEIS does an entire about face. It abandons the distinction between readily available phosphorus and particulate phosphorous (more about that later in these comments under the section: "The SEIS, a Systemic Failure to Neutrally Evaluate.") The SEIS now relies upon a letter dated December 11, 2015 received from Dr. Chaffin at The Ohio State University. Dr. Chaffin, in essence, writes that the release of 850,000 CY of silt/sediment loaded with phosphorous and nitrogen does not matter because it is less than 10% of the total annual phosphorous load to Lake Erie. Dr. Chaffin explains how more than this is dredged yearly out of the Toledo shipping channel and that has no effect. Dr. Chaffin concludes that the phosphorus release will not impact Sandusky Bay (nitrogen driven), nor

affect Lake Erie's ecology, nor affect the Western Basin, nor, for that matter, the dead zone in Central Basin.

To me, this is incredible. Again, it is a case of: "One can't see the forest because of the trees." Or, more precisely: "One can't see the phosphorous because of the phosphorous; there's just so much of it."

The only way I know how to effectively expose this irrational view is to put forth the following hypothetical narrative.

Farmer Joe farms 40 acres. He does not use environmentally sound farming techniques. He over fertilizes, applies fertilizer during rain events, and does not try to capture soil erosion and runoff. All of this goes into watershed system that empties into Lake Erie. But, Joe's actions are believed not to matter. The environmental effect from Farmer Joe's 40 acres is too small to measure, let alone have any significant effects on Lake Erie.

Eventually, all the farmers in the watershed say: "I want to be like Joe. It's too costly to comply with these environmental suggestions." So, all the farmers do what Joe does. A few years pass and Lake Erie erupts in one massive HAB bloom, because of the cumulative effects of the massive phosphorous runoffs. Internal loading is now in play because of all these small individual runoffs that were not stopped. The total amount of phosphorous permanently in the Lake becomes staggering; it is beyond comprehension. Suddenly, cities start losing their water supply; boating, jet skiing, and swimming are banned; and, no one wants to go fishing anymore.

Sound familiar? It is too bad someone did not stop Farmer Joe.

The facts in this case are worse than the "Farmer Joe Narrative." We are not dealing with a small phosphorous runoff from Joe's farm. In this case, we are sending the whole farm and more into the river! It has been calculated that the 840,000 cubic yards of material in the containment area will cover 38 football fields, 10 feet deep with sediment; a football field is 1.3 acres, including the end zones.

How can the SEIS's specious view of this problem be taken seriously by anyone? Where is the forethought in this analysis?

It is painfully obvious to me that the right questions were simply not asked in this instance by the SEIS!

What will be the cumulative effect of the sediment release from the Ballville Dam on the Sandusky River, the Sandusky Bay and Lake Erie five years from now? How about ten years from now, or twenty years from now?

The cumulative effect of phosphorous is a critical issue; internal loading in some lakes is now greater that external loading. There are volumes of literature on this process. Why weren't these questions asked?

Add another variable. What effect will global warming have on this scenario? Ten years out? Or, even twenty years from now?

The Sandusky River, Bay and the Western Basin of Lake Erie are remarkably shallow. How will two, three or four more degrees of temperature added to this chemical brew affect the HAB's?

There are many scientific publications on these issues. Why did the SEIS fail to research that body of literature, some of which is specific to Lake Erie? Global warming is an accepted scientific fact. Any increase in Lake temperature, over the norms, mixed with high nutrient load will certainly exacerbate current conditions. Why wasn't this issue properly studied?

4) A Failure to Accurately Determine How Much Sediment is Stored in the Impoundment Area.

The most important environmental marker to be determined by the FEIS and the SEIS is: "How much sediment is contained in the impoundment area behind the dam?" The answer to that question is absolutely critical in accurately understanding all the serious environmental consequences that flow from the release of that sediment. Without accurately knowing how much sediment is contained behind the dam, it is impossible to accurately access real and potential harm caused by the release of material contained in the impoundment area.

The SEIS has failed miserably in coming up with an accurate figure on the quantity of the sediment.

There are only two estimates ever made concerning the amount of sediment and they differ greatly in amount and logic. In 2002, Dr. Evans made an estimate of 1.3 million cubic yards. In 2011, some nine years later, Stantec estimated the sediment to be 840,000 cubic yards—only 65% of Dr. Evan's figure.

Dr. Evans concluded that the impoundment area was approaching full containment in the 85% area, while Stantec, nine years later, claims that the reservoir had now reached or is near equilibrium. Stantec's estimate is now five years old.

Yet, homeowners who live on the impoundment area and whose homes abut the river, personally attest to sediment continuing to build up annually.

One would reasonably anticipate that Dr. Evans' estimate, made 14 years ago would be low, as the impoundment area has continued to fill since that assessment was made. Efforts in the SEIS, at section 4.1.2.1.2, to explain the difference between the Evan's and Stantec's estimates simply cannot logically account for a difference of 35%. Both studies used a 1903 pre-dam topography map and both used bathymetric surveys. Geomorphic changes and the island landmass above water does not account for 35%.

How can the SEIS pick the Stantec estimate over Evans when logic and reason would say that more sediment would be in the impoundment area now than in 2002, not 35% less?

To put this issue to rest, the SEIS should order a new, neutral survey of the impoundment sediment. This would give an account of the present silt/sediment existing there. It would resolve the great disparity between the two existing estimates. To simply choose one over the other under these articulated circumstances is, in my opinion, an arbitrary act on the part of the SEIS. I have more comments on this in the section: "The SEIS, A Systemic Failure to Neutrally Evaluate."

5) A Failure to Explore Meaningful Estimates for Sediment Removal

In NEPA type studies, low estimates can be disastrous, but unreasonably high estimates are even more egregious. This is so because excessive monetary estimates simply stifle meaningful discussions on critical

environmental issues, before they even begin. They can kill a viable option to solving a problem before any serious discussion is held.

That is exactly what happened in the FEIS and is now perpetuated in the SEIS as it relates to meaningful estimates for the removal of the material in the impoundment area.

Stantec estimated it would cost $64M or $80 per cubic yard to dredge the impoundment area, and another $29M to dewater, load, haul and dispose of the material for a total of $93M. (This will be addressed further in this writer's comments: "The SEIS, A Systemic Failure to Neutrally Evaluate").

In contrast, the USACE reports indicate the average private industry nationwide standard to dredge is $5.15 per cubic yard, not $80 per cubic yard.

In fact, USACE removes 800,000 cubic yards annually from Toledo Harbor. This is nearly the same amount of material Stantec claims is in the impoundment area. Of that extracted material 84% goes to open lake dumping, 14% goes to confirmed disposal facilities and 2% is repurposed for near shore placements/improvements. All of this is done for an annual budget near $5M.

The differences between $5M and $64 M or 93M are simply not reconcilable. Differences that great cannot be explained by citing such things as seasonal and site-specific accessibility as the SEIS does.

The SEIS, instead of seriously working to solve this issue and come up with new, sound and innovative methods to extract this material for a reasonable cost, now chooses to once more do an about face. The SEIS now deemphasizes the Stantec numbers and cites Evans et al. (2002) study.

In that study, Evans estimates a cost of $6.3M for a partial dredging option of 27% of the impoundment area, approximately 350,000 cubic yards. (SEIS 2.2.1). The SEIS then makes the following observation: "...$6.3 million is approximately equivalent to the total cost estimate of the Proposed Action, $6.28 million (Section 3.1.1.4). Therefore, even under the most conservative of our estimates available, if partial impoundment dredging were included as a sediment management technique within the Proposed Action, the total cost estimate increases from $6.28 million to $12.58 million."

The SEIS then concludes that: "Due to the estimated costs when viewed in light of the expected limited long term risk of impacts downstream, it was determined that dredging the impoundment was neither necessary nor economically feasible." Section 2.2.1 (2-4)

Once more, the SEIS sets forth reasoning, on a critical issue, that is so illogical it borders on the absurd.

Put another way, what the SEIS is really saying is we just will not deal with these inflated Stantec numbers. We will not ask how they came to be, or seek to delve into Stantec's comparables. We have an old estimate from Evans for $6.3 million to get rid of 27% of the silt, 350,000 cubic yards, and we will use that.

First, of all, the 350,000 cubic yards represents 42% of the impoundment material not 27% and that should be changed in the SEIS. This is so because the SEIS accepted Stantec's estimate of the sediment 840,000, and rejected Evan's estimate of 1,300,000 cubic yards. This apparently has now become a "pick and choose" situation between the reports.

Second, the SEIS then adds the $6.3 million estimate to remove 42% of the material to the project cost of $6.28 million, now totaling $12.5M. Interestingly the new $12.5 M estimate, which includes removal of 42% of the silt, is very close to the December 2014 Opinion of Probable Construction Cost (OPCC) estimate of $11.5 M prepared for Fremont by its contractor MWH (Executive Summary, E-2).

This additional cost to remove the silt has no bearing on anything, until the SEIS concludes that it is not necessary or economically feasible to dredge the impoundment area because of "limited long term risks" of impacts downstream.

The SEIS plugs in the key words: "limited long term risk of impacts downstream" whatever that means, and concludes that it's not necessary to dredge the impoundment area nor economically feasible. Don't talk about the damage caused in the short term. Just forget about dealing with all these issues. "

How does the SEIS define: "unlimited long term risks", "limited long term risks" and "no long term risks?"

What is the difference between facing "unlimited long term risks", "limited long term risks", and "no long term risks", as relates to the release of the silt/sediment in all aspects of this project; i.e. property damage to marina's, restaurants, individual property owners; nutrient load effects on the water system, navigation impairments, etc?" Please explain.

What estimated monetary expenditure would justify the dredging of the impoundment area? $1,000? $1million? $5 million? What amount?

Since the SEIS is using the term: "limited long term risks", what are the "unlimited short term risks" for releasing the silt/sediment in the impoundment area?

What estimated monetary expenditure would justify the dredging of the impoundment area to eliminate "unlimited short term risks?" $1,000? $1million? $5 million? What amount?

Has the FEIS or SEIS explored or considered the availability of any grants or public money that could be used for the removal of the silt/sediment in the impoundment area? If so, what are those sources.

Has the SEIS explored or considered seeking estimates for the silt/sediment removal from the many innovative companies that employ state of the art technology to remove sediment from contained areas?

The DEIS/FEIS totally blew off a suggestion by Universal Farms, a long established business, near the construction site, that is licensed to handle waste. The suggestion was to recycle the impoundment material and sell it for a profit. Why did it do this?

Does the SEIS feel it is appropriate to spend public money to dredge and remove silt/sediment that contains heavy nutrient loads of phosphorous and nitrogen, such as that impounded behind the Ballville Dam, that otherwise would be released into the Great Lakes Watershed, so as to comply with existing agreements and legislation to reduce sediment, phosphorous, and nitrogen in the Great Lakes Watershed?

The SEIS, A Systemic Failure to Neutrally Evaluate.

The EIS and SEIS are nothing more than a post hoc rationalization approving a previously written, joint venture agreement entered into between the City of Fremont and the ODNR. "The Project" as it was called was for the City to build a new reservoir and remove the Ballville Dam. In return, the City would receive $5 M to build the reservoir. There also was an implicit understanding that the ODNR would help the City secure enough grant money to help cover the cost of the reservoir and the removal of the Dam.

NEPA studies are to take a hard look at environmental issues and provide political decision makers with information sufficient to make informed policy decisions. In this case, due to the maneuvering and scheming of the ODNR, that did not happen here. This is the same ODNR that is a principal cooperating party with the US Fish and Wildlife Service for the very preparation of the FEIS and SEIS. The integrity of the process has been compromised.

The ODNR entered into an agreement with the City of Fremont, approved by the Mayor and voted upon by City Council to remove the Ballville Dam in 2008, long before the EIS scoping process began. The ODNR promised the City a $5M grant for the building of a reservoir (conditioned on boating being allowed on the reservoir) and the Ballville Dam being removed.

Thus, the entire city government committed itself to removing the Ballville Dam without knowing that the impoundment sediment would be let loose into the watershed, without knowing that an ICS would be built in the dam's place, and without knowing that Lake Erie would be ravaged by HAB's some six years later. The city was in the dark, without even so much as an environmental candle flicker, to guide them when they decided to take down the dam in 2008.

With the city firmly committed to removing the dam and with fear that it would end up in a lawsuit to repay the ODNR the five million, if it did not, the City moved ahead with both projects, the reservoir project and dam removal project, contractually linked as one project and called "The Project" in the written agreement. While the city did later hold another vote on the issue and a referendum was placed on the ballot concerning that later vote, nothing diminished the City's and the ODNR's resolve to remove the dam,

even though the EIS was years away from being finalized and still today is not finalized as the draft SEIS is now open for comment. These decisions, all of them, were made without a completed NEPA study.

The ODNR is and has been the prime mover for taking down the Ballville Dam. Material received from public records requests reveal ODNR communications, spanning over 15 years, which advocated and worked for the dam's removal. ODNR publications promote the removal of the dam so that the Sandusky River Walleye can be given the extra 20 miles of river habitat to spawn in. The ODNR is obsessed with this mission, as Walleye fishing is Ohio's big money fish, bringing in hundred of millions of dollars.

Yet, the ODNR is not above fixing studies that do not promote the department's official line, case in point: the Eric J. Weimer, 2010 report, cited at pages 2-3, supra.

Many months ago, I was told of this report, which concludes that the Ballville Dam does not impede Walleye movement upstream. I was shocked and shared the report with some news reporters that I had been in contact with. One of the individuals informed me that he confronted ODNR officials about their own study.

Immediately thereafter, the report was no longer available for access on line. It remained off line for several days. When it came back on line, it had been edited and the effects of the study softened. Now, the Walleye would need "remedial" help to go upstream.

I questioned the DEIS/FEIS on this matter and was told I had an old version of the study! Really? Nowhere does the current report show when it was reedited or who reedited it. So, in terms of scientific publications what ethical rules were violated once a document has been published and then reedited without giving the details of when and who changed the material?

Is this the way the process works? It is the way the ODNR works, one of the cooperating partners in this report that has had great imput?

Even though the Weimer report exists, even though no studies have been done (no hard look given) on how Walleyes will be able to swim through the debris dams that will form on the ICS's pillars, even though the water at the

former dam site will be rushing white water, the SEIS insists that the Walleye will use the newly opened river up stream.

Did the ODNR write that portion of the SEIS? If so, who were the supervisors who signed off on it?

There exists more evidence that this study has been compromised on virtually every critical issue.

Again, under the public records act, an e-mail was uncovered suggesting that the city hire its own engineering firm to do the NEPA study rather than relying on the Army Corp—the rationale being that the City would have better control of the study. The City did just that and hired Stantec to provide the engineering reports critical to a fair and unbiased report.

That firm also very conveniently provided the $64 M estimate to dredge the impoundment material, $80 per cubic yard, silencing discussion on the matter until it was pointed out at the Fremont Town Hall Meeting in October 2014 that the nationwide private company standard is $5.15 per cubic yard. At that meeting were all the agencies: US Fish and Wildlife, ODNR, the City of Fremont Officials, and the Army Corp people were in attendance. When Stantec's representative was confronted about the high estimate, his response was that they cleaned up the river silt/sediment on another project at a much higher per cubic yard cost. When asked to disclose the information on this other project, the firm refused.

The same representative, at the same meeting, was asked how you would ever clean up the debris mess that would form on the ICS structure. This question was asked after photos were shown of the debris that formed on the ICS where it was employed on Cazenovia Creek in West Seneca, NY. The response was you don't have to clean it up; it will just float away during the next high water period!

The same firm provided the 840,000 cubic yards estimate of sediment material in the impoundment area, 35% less than Dr. Evan's estimate. Logic would suggest that more sediment should be present. This is so because significant time has lapsed since Evan's estimate and the impoundment area continues to fill up according to eyewitness reports of those whose property abuts the impoundment.

Perhaps even more disturbing is how the FEIS handled the phosphorous issue centering upon the distinction between readily available phosphorus and particulate phosphorous and then totally abandoning the interest in that distinction in the SEIS.

During the comment period, I asked in written question form why testing was not done to determine how much particulate phosphorous would convert over to readily available phosphorous when the sediment was released into the Sandusky River. The reply was there is no such testing currently available. I then contacted a Chicago chemist who, in a matter of minutes, designed an *in situ* test using river water, sediment samples, and a control—a test that could be conducted in any collage laboratory.

Why hasn't the SEIS performed such a test to determine how much of the phosphorus will convert over upon its release? Has this basic science been trumped by one opinion letter from Dr. Chaffin, when there exists extensive literature underlying the importance of knowing the answer to this question? Internal loading and external loading are now critical issues that should be addressed.

Ironically, in the end, everything went wrong on "The Project," memorialized by that fateful agreement in 2008 between Fremont and the ODNR.

The City built its reservoir and received the $5 million. Then, with the help of the ODNR, the City received another $7 million in grants to cover the anticipated full cost of $12 to $13 million. The ODNR kept its bargain and the City got its free reservoir. No, it did not work out that way. The reservoir was built on an unsuitable site of karst topography. The final cost came in somewhere around $45 million, $33 million over budget.

As to the second phase of "The Project", the removal of the Ballville Dam, costs were initially estimated to be $12 million. Now, those estimates are reduced to $6.28 and again grant money has been received, but not enough to cover the entire cost.

So, the NEPA study in this case is little more than a post hoc rationalization for a 2008 agreement entered into by the City of Fremont and the ODNR, two participating and cooperating agencies to the study.

The FEIS and SEIS have failed to forthrightly access the silt/sediment damage, on both a short term and long term basis, that will be occur if it is released into the waterways. The FEIS and SEIS have made no effort to seek reasonable methods to remove the impoundment material before the dam is removed.

Sadly, the NEPA study has suffered a systemic failure. It played no role in the original 2008 agreement between the ODNR and the City of Fremont to remove the dam. The integrity of the document has been further compromised by a lack of reasonable estimates and efforts to secure reasonable solutions to critical issues.

Very Truly Yours,

James R. Sherck

US Army Corps of Engineers
Buffalo District

FACT SHEET

February 2015

CAZENOVIA CREEK, ICE CONTROL STRUCTURE (ICS) - WEST SENECA, NY

Small Flood Control Projects
Section 205 of the Flood Control Act of 1948, as amended
Construction General (Continuing Authorities Program)

Location

- Located on Cazenovia Creek in the Town of West Seneca, Erie County, New York

Project Description

- The Ice Control Structure (ICS) is comprised of steel-jacketed concrete piers anchored into bedrock across Cazenovia Creek to act as an ice retention barrier to reduce downstream flooding
- Federal funds used to complete the ICS project was $3,744K
- Volume of log and debris jams and the speed at which it amasses was unanticipated; creating conditions of turbulent overflows that scours and erodes right bank riprap revetment, the access road, and the maintenance area. Severe damages occurred in December 2007 and March 2008
- Design deficiency was evaluated resulting in recommendation to extend existing berm further upstream of the ICS to control overflows and repair the riprap revetment, access road and maintenance area

Importance

- NYSDEC requested USACE to investigate the ICS operation. USACE concluded that repairs are needed to the ICS area and that design improvements are equally necessary to mitigate future damages

Consequences

- If repairs and design improvements are not implemented in a timely manner, the erosion and degradation of the area will continue to worsen and will increasingly encumber the municipality's already compromised ability to maintain the ICS
- If left unaddressed, ice flows will circumvent the ICS and severe downstream flooding will again take place

Project Phase	Est. Fed. Cost of Phase	Federal Funding through FY14	FY15 Requirement	FY15 Budget	FY16 Requirement	FY16 Budget
Estimated total Federal cost to repair and improve the ICS.	$500K	$500K	$0K	$0K	$0	$0

Project Sponsor/Customer

- New York State Department of Environmental Conservation (NYSDEC)

Congressional Interests

- Representative Chris Collins R-NY-27
- Senator Charles Schumer D-NY
- Senator Kirsten Gillibrand D-NY

Current Status

- The Project Cooperation Agreement (PCA) Amendment between USACE and project sponsor was signed was signed November 17, 2014
- The signed PCA Amendment was returned to the NYS DEC for processing to the NYS Comptroller's office so that the non-Federal funds could be issued for the project

Issues

- Awaiting receipt of the non-Federal funds

Cazenovia Creek Ice Control System (ICS)

Excessive Debris Build-up

Eroded Revetment Downstream of ICS

Maintenance Road Compromised by Erosion

Project Manager: Casimir Brzozowiec, (716) 879-4232, Casimir.Brzozowiec@USACE.Army.mil.

Main Identity

From: [redacted]
To:
Cc:
Sent: Friday, April 08, 2016 1:36 PM
Attach: master03.htm; pres.xml; master01.htm
Subject: Presentation5.ppt slide 3 impoundment waters looking toward the dam

March 15, 2016

Mr. Brian Elkington
Program Supervisor
U.S. Fish and Wildlife Service
Midwest Region Regional Office – Fisheries
5600 American Boulevard West
Bloomington, MN 55437

Dear Mr. Elkington:

We now have two independent rounds of very extensive and exhaustive sediment testing. The published analysis of the sediments, indeed appear to be levels that would not cause any adverse environmental effects if the Ballville Dam is removed.

The expertise assembled to conduct this extremely, in-depth study comprise a blue-ribbon panel that are demonstrated leaders in their fields. Even the algae issue has been properly addressed. The experts have dismissed the Sandusky River sediments as a phosphorous source for algae. Further support is presented by the fact that the Toledo shipping channel annually dredges and open-lake disposes an average of 1,000,000 cubic yards of sediment. This event has happened for many years and also has been determined to be a non-factor for supporting algae blooms. The experts have provided all of the assurances that anyone should need, that the removal of the Ballville Dam is the absolute right decision. Prudent decisions should always be based on demonstrated facts and the proof has been definitely presented by the Supplemental Environmental Impact Statement.

Other facts have sometimes been kept under the radar or even conveniently left out of many conversations.

There is the huge issue concerning the current safety conditions of the Ballville Dam and the significant liabilities that would ensue should there be a catastrophic event. The Ballville Dam has been designated as a Class I High Hazard Dam. The repair of the dam is one of the proposals, but the costs would entail millions of dollars and the City of Fremont has zero dollars to spend.

A second high priority is achieving Aquatic Life Habitat Use-Attainment, as defined by OEPA in Section 3745-1-07 of the Ohio Administrative Code. The only proposal that will achieve these goals is the removal of the Ballville Dam. It is also the only proposal that would be granted insurance of federal funds.

An addition to one of the proposals includes a fish elevator. As to whether fish would willingly go into the elevator is very questionable and, unfortunately, if they do go and spawn above the dam, there are no provisions for them to safely return downstream. The only travel return is back over the spillway and all of the fish would perish.

The removal of the Ballville Dam will add over 20 miles of ideal spawning habitat. Biologists are estimating that the walleye larvae will be increased eight times over the current Sandusky River hatch.

Sauger, which were once abundant in the river, will be re-introduced when the river returns to natural flow. The improved river flow will benefit all aquatic species compared to present conditions.

Finally, in addition to greatly enhancing the Sandusky River and the surrounding area, there are regional benefits as well. The Ohio, Michigan, New York, Pennsylvania and the Province of Ontario waters of Lake Erie will all see a walleye population increase as the Sandusky River fish expand across the Lake.

There has never been anything bad happen when a dam is removed. It is well-past time that this one goes down.

Regards,

Capt. Dave Spangler
Vice President
Lake Erie Charter Boat Assn.

RICHARD C. SAHLI, ATTORNEY AT LAW

Richard Sahli Law Office, LLC, 981 Pinewood Lane, Columbus, Ohio 43230-3662
614-428-6068 - rsahliattorney@columbus.rr.com
Protecting Ohio's Environment since 1995

June 2, 2016

Brian Elkington
U.S. Fish and Wildlife Service Fisheries
5600 American Boulevard West, Suite 990,
Bloomington, MN 55437-1458

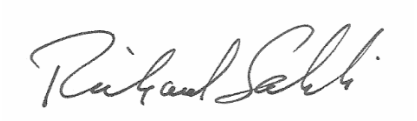
Transmitted by electronic mail to: Ballvilledam@fws.gov

Dear Mr. Elkington:

Thank you again for travelling to Columbus to meet with Sierra Club's representatives on the Ballville Dam NEPA issues. We appreciated the opportunity to meet with FWS and ODNR representatives and to have a frank discussion of our respective concerns.

I also want to take this opportunity to relay to your office an amendment that I have found necessary in the Sierra Club's April 11, 2016, comments on the Draft SEIS. Comment 16 on page 12 states that the FWS should calculate a range of Total Suspended Solids ("TSS") that release of the sediment from the Ballville Dam impoundment would probably generate within the Sandusky River. I note on page 5-20 of the Draft SEIS that FWS adopted an estimate from the 2011 Stantec report of 50 to 500 ppm which appears in the context of the paragraph to be an estimate of TSS. I apologize for this oversight and ask you to consider the Comments amended along these lines. I also note that this predicted range on TSS from the Stantec 2011 document is within the range for impacts identified in the Klamath River report that forms the heart of the Comment on fish impacts. Accordingly, this amendment does not affect the Sierra Club's concerns over the impacts on fish identified in the comment that we believe are inadequately addressed in the Draft SEIS. However, we want to keep the record clear that FWS has identified a predicted range of TSS increases to be caused by the release of the sediment which our Comment did not acknowledge.

Sincerely,



Richard C. Sahli
Counsel for The Sierra Club

April 11, 2016

Brian Elkington
U.S. Fish and Wildlife Service Fisheries
5600 American Boulevard West, Suite 990,
Bloomington, MN 55437-1458

Transmitted by electronic mail to: Ballvilledam@fws.gov
and by fax to: (612) 713-5289 (Attention: Brian Elkington).

RE: COMMENTS BY THE SIERRA CLUB ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT ("DRAFT SEIS") ON THE BALLVILLE DAM REMOVAL, FREMONT, OHIO

Dear Mr. Elkington:

Pursuant to the notice in the Federal Register published by the U.S. Fish and Wildlife Service ("FWS" or "Service") on February 26, 2016, 81 FR 9877-9878, announcing the availability of the Draft SEIS for the Ballville Dam Removal, Agency Docket FWS-R3-FHC-2016-N110, the Sierra Club submits the following comments for consideration and response by the FWS in preparing a Final SEIS.

The Sierra Club is the nation's oldest grassroots environmental nonprofit organization, with more than 630,000 members nationwide, including over 17,700 in Ohio and 250 in Sandusky County where the Ballville Dam is located. The Sierra Club's mission is to explore, enjoy, and protect the wild places of the earth and educate and enlist humanity to protect and restore the quality of the natural and human environment. Since its founding over a century ago, Sierra Club has become a leader in working to preserve the quality of the nation's surface waters. The Sierra Club has 68 chapters and hundreds of local groups, one of which, the Western Lake Erie Section, includes Sandusky County and has approximately 1,300 members. Sierra Club members frequently visit the Sandusky River and its vicinity that will be impacted by the sediment discharged from the Ballville Dam impoundment. Sierra Club members use these waters for recreation, fishing and aesthetic enjoyment for which water quality is critical and these members will be harmed by the impacts of the sediment release on the Sandusky River, Sandusky Bay, and Lake Erie, in the manner proposed in the Draft SEIS.

As a general overview, the Sierra Club is deeply disappointed that the Draft SEIS continues to inadequately consider - and then arbitrarily dismisses - the serious harms that the release of the contaminated sediment from behind the Dam poses to the Sandusky River, Sandusky Bay, and Lake Erie. While the additional sampling ordered by the U.S. Army Corps of Engineers has been valuable in clarifying the extent of that contamination beyond the minimal

information that was presented in the Final EIS and the Sierra Club commends the Corps for its action in that regard, the SEIS does not materially advance serious consideration of the threat posed by the relatively free release of the sediment proposed by FWS in the EIS and SEIS on the Sandusky River, the locally significant fish spawning grounds and community fishing area within Fremont immediately downstream from the Ballville Dam ("the levee area"), and the impacts that the nutrient laden sediment poses for the serious, existing problem of Lake Erie Eutrophication in both its Western and Central Basin.

For these reasons, the Club strongly urges the Service to commit to major revisions to the current draft of the SEIS in order to meet the legal requirements of the National Environmental Policy Act of 1969 ("NEPA"), especially that Act's goal of preventing environmental harms from being overlooked or underestimated. As it currently stands in the Draft SEIS, the FWS has not yet truly faced the Club's concerns with the sediment problems presented by the Dam removal but instead continues to sweep the issue "under the rug" without a full disclosure of the accompanying risks and alternatives so that the public may weigh the project's benefits against its true environmental costs. The Sierra Club remains committed to working with the Service to ensure that NEPA's important goals are met and that the manner of the Dam's removal, a goal we both share, is accomplished effectively and without avoidable harm.

COMMENTS

I. FAILURE TO ADDRESS IMPACTS ON LAKE ERIE EUTROPHICATION

Eutrophication is a problem throughout Lake Erie due to excessive concentration of nutrients. The worsening problems of eutrophication are primarily manifested in the Harmful Algal Blooms (HABs) in the Lake's Western Basin, the growing zone of hypoxia (oxygen deprivation) in the Central Basin, and the reoccurrence of *Cladopora* blooms along the northern near shore of the Eastern Basin, see, Report on Recommended Phosphorus Loading Targets for Lake Erie, May 11, 2015, from the bi-national Annex 4 Objectives and Target Task Team to the Nutrients Annex Subcommittee implementing the Great Lakes Water Quality Agreement (GLWQA), ("Annex 4 Report" available at: http://binational.net/wp-content/uploads/2015/06/nutrients-TT-report-en-sm.pdf), p. 1. Phosphorus loadings into the Lake are the primary cause of eutrophication, although nitrogen loadings may also contribute to this problem, *ibid.*

The EIS and Draft SEIS both freely acknowledge that a substantial amount of the sediment currently behind the Ballville Dam, at least the finer grained sediment, will ultimately be deposited into the Sandusky Bay and Lake Erie, just eighteen (18) stream miles from the Dam, see, e.g., SEIS p. 5-9, predicting "the export of the smallest particles to Lake Erie." The SEIS also acknowledges that the sediment is contaminated with agricultural nutrients reflecting the

fact that agriculture is the dominant land use within the Sandusky River watershed. Although the Service does not address the quantity of nitrogen to be released with the sediment, it does quantify the amount of phosphorus, at SEIS p. 5-6, as being 346 metric tons of phosphorus based on the Services' assumed total sediment behind the Dam of 840,000 cubic yards and sampling data that the average phosphorus content for the sediment is 757 mg P/kg. The SEIS then reduces this amount of phosphorus released to a range of 288 to 205 metric tons based on an estimate that only 500,000 to 700,000 cubic yards of that total sediment is potentially mobile.

The SEIS then simply dismisses this quantity as having no potential environmental impact on the Lake, but does so only by proffering expert opinion (quoting only one at length) that is inadequate under NEPA as it is inadequately supported technically, is based on a methodology irrelevant under NEPA of dismissing the impact of the Ballville Dam sediment on the basis of comparing it to other, more dominant sources contributing to eutrophication, and, most surprisingly, by failing to consider significant conflicting information from the leading scientific bodies formally charged with addressing Lake Erie's escalating eutrophication. The impact of this quantity of phosphorus on Lake Erie needs to be assessed in the SEIS in order to fully determine the environmental impacts of the Dam's removal consistent with NEPA while the potential contribution of nitrogen from the sediment also needs to be quantified and considered.

Based on this overview, the Sierra Club makes the following specific comments relating to the Ballville Dam sediment's contributions to Lake Erie eutrophication.

1. There is considerable scientific controversy over how to categorize Sandusky River's discharge as contributing to either the Western Basin of Lake Erie with its serious and growing problems with Harmful Algal Blooms (HABs) or to the Central Basin with its serious and growing hypoxia zone. Historically, the Sandusky River has been considered part of the Western Basin, see, e.g., the Ohio Lake Erie Phosphorus Task Force Reports II report of November, 2013, at http://www.epa.state.oh.us/portals/35/lakeerie/ptaskforce2/Task_Force_Report_October_2013.pdf., Ohio EPA's TMDL Final Report on the Lower Sandusky River available at http://www.epa.state.oh.us/dsw/tmdl/SanduskyRiver.aspx#122016470-tmdl-report, p. 12, while the Annex 4 report placed the Sandusky River discharge into the Central Basin. For this reason, as a first step in assessing the impact of the added nutrients from the Ballville Sediment to Lake Erie, we recommend that the SEIS include a clear determination of which Basin the Service believes the Ballville sediment will effect, if not both, and the reasons supporting that decision.

2. In the EIS, the Service dismissed citizen comments regarding the harm that the nutrients from the sediment posed for aggravating Lake Erie eutrophication based only on a response to comments essentially stating that particulate phosphorus [PP] could be ignored for all intents and purposes as contributing to HABs because Dissolved Reactive Phosphorus [DRP]

was more bioavailable, although without quantification. See e.g., ROD, Appx. A, p. 17, p. 38. In its letter of October 16, 2015, the Sierra Club criticized this response for failing to account for the fact that a significant percentage of particulate phosphorus becomes bioavailable in the environment. The SEIS does not address this question of bioavailability of particulate phosphorus. Accordingly, we recommend that the SEIS clarify the Service's position on whether it continues to rely on its previous responses regarding particulate phosphorus as being irrelevant or whether it acknowledges the role of particulate phosphorus in Lake Erie eutrophication, including HABs. If it is the latter, we request that the SEIS plainly indicate the percentage (or range thereof) which the Service considers the particulate phosphorus in the Ballville sediment to become bioavailable.

In this regard, we refer the Service to the Annex 4 Report, p. 32, which concludes that "PP [particulate phosphorus] is between 25-50% bioavailable and represents ~80% of the TP [total phosphorus] load." The Sierra Club considers this Report to be authoritative and represents the best science on the phosphorus loading question for Lake Erie. Does the Service agree with this statement from the Annex 4 Report or does it utilize a different percentage?

3. The Sierra Club also notes that the Annex 4 Report unequivocally concludes that reductions in Particulate Phosphorus as well as dissolved reactive phosphorus (DRP) are necessary to address Lake Erie's eutrophication problems in both the Western and Central Basins and that "the models conclude that totally eliminating DRP without changing the PP load will not by itself solve the problem," p. 32. Further, the report recommends, for the Western Basin, that "it would be prudent to aim for equal percent reductions of both," p. 32. Does the Service agree with these conclusions on the need to reduce particulate phosphorus to Lake Erie? If not, does the Service have a justification for its position and any basis for finding the Annex 4 report to be in error?

4. The SEIS takes the position that up to 288 metric tons of phosphorus from the Ballville Sediment could migrate to Lake Erie without any need under NEPA to address the resulting environmental impact on Lake Erie's eutrophication problems. The SEIS takes this position based on a comparison of this amount of sediment and the roughly similar amount of Western Basin open dumping of dredged sediment that was deemed to be insubstantial in contributing to Western Basin algal blooms, but only in comparison to the far greater uncontrolled discharge of nutrients from the Maumee River. It is Sierra Club's position that this simple comparison is improper under NEPA where the question is the amount of harm that the phosphorus in the Ballville Dam sediment presents and the capacity to minimize that harm, including through a proper consideration of alternatives. While the Sierra Club concurs that agricultural run-off is a more substantial problem in Lake Erie Eutrophication,

the contribution of the Ballville sediment cannot be simply dismissed from NEPA's requirement that it receive a hard look merely by pointing to a larger problem. This point is all the truer in this case where the larger problem of agricultural run-off of nutrients is not currently controlled under federal and Ohio law but the Ballville Dam sediment problem is controllable through a rigorous application of the NEPA process. For these reasons, the Service must undertake a determination in the Final SEIS of the environmental impact of the release of the nutrients in the Ballville sediment on its own merits independent of other factors contributing to nutrient loading in Lake Erie that are irrelevant under NEPA.

5. Based on the phosphorus loading targets of the Annex 4 Report, the Sierra Club believes it is undisputed that the contribution of phosphorus from the Ballville Dam is substantial and cannot simply be swept under the rug as it is in the Draft SEIS. To address the problem of Central Basin hypoxia, the Report concludes that the maximum annual load of Total Phosphorus to the Western and Central Basin, including the Detroit River and atmospheric load, is 6,000 Metric Tons, Annex 4 Report, p. 3. Reaching this goal will require a 40% reduction in the existing load, *ibid.* The 288 metric tons of phosphorus in the Ballville Dam sediment is 4.8% of that 6,000 tons, which is a substantial percentage that cannot be ignored as the SEIS attempts to do. Inasmuch as this target is based on an annual loading, the mitigation tactic relied on in the SEIS with the seasonal release of the sediment is irrelevant to this issue; see Annex 4 report, p. 34: "All models and data suggest that the best load-response relationship is derived from the annual load to the Western Basin + Central Basin because of their combined effect on phytoplankton production in the Central Basin, regardless of when that load is input."

6. The SEIS also attempts to trivialize this contribution of phosphorus by stating that the Sandusky River's discharge hugs the shoreline and does not contribute to Central Basin hypoxia or the internal loading of phosphorus that occurs there, p. 5-6. No information is supplied to support that conclusion and the Sierra Club has not located any source supporting that conclusion. More significant is the fact that this conclusion is directly contradicted in the Annex 4 Report which states, at page 38: "The Sandusky River flows into Sandusky Bay that empties into the Central Basin. It carries a large phosphorus load and is an obvious priority to reduce Central Basin hypoxia." See also Table 5 on p. 38 that lists the Sandusky River as a "priority watershed" for Central Basin hypoxia and nearshore Cyanobacteria. It is evident to the Sierra Club that this definitive conclusion from the Annex 4 Task Team on the leading priority of the Sandusky River in remedying Central Basin hypoxia is in no way overcome by the diametrically opposing but unsupported statement in the SEIS. For this reason, the SEIS must deliberately assess the environmental harm resulting from the Ballville Dam sediment on Lake Erie's Central Basin hypoxia problem and develop appropriate means and alternatives that minimize that harm.

7. The SEIS also contains the statement that the well-documented problem with Harmful Algal Blooms in the Sandusky Bay can be ignored as an environmental harm caused by the Ballville Dam sediment because those blooms arise in a nitrogen limited environment, p. 5-7. The SEIS however provides no data supporting the highly generalized opinion given in the SEIS of no-effect; that opinion needs to be fully supported so that it can receive future comment if it is made part of the Final SEIS.

8. The conclusion in the SEIS that the phosphorus in the Ballville Dam sediment can be ignored as contributing to the Sandusky Bay HABs is also contradicted by the Annex 4 report which specifically calls for phosphorus reduction in the Sandusky River to address the blooms in Sandusky Bay, at p. 38 stating:

> "However, the cyanobacteria blooms that occur annually in Sandusky Bay start the earliest, last the longest, and reach the greatest algal cell densities of any in Lake Erie. For this reason, while not contributing to Western Basin cyanobacteria blooms, the Task Team believes that spring reductions in P loads should be a priority for this watershed in addition to annual reductions."

Further, the emphasis in the SEIS on nitrogen loads rather than phosphorus has been considered and rejected in the Annex 4 Report, see p. 42, "Role of Nitrogen Loads," which notes that N reductions may have relevance but that the strong consensus is on prioritizing P loads for addressing the Central Basin hypoxia problem and cyanobacteria control in part because "there is no guarantee that N reduction alone will reduce cyanobacteria blooms or Central Basin hypoxia reduction." Accordingly, the SEIS has adopted, without explanation or support, what appears to be a minority viewpoint that was rejected in the Annex 4 report.

9. The conflict between the Annex 4 report and the information in the SEIS cited above directly reinforces the Sierra Club's concern that the Service has prejudged the sediment issue and is improperly using the EIS process only to support that prejudgment. The information in the SEIS cited in comments 6 and 8 contradicting the Annex 4 Report is from Dr. Chaffin; however, Dr. Chaffin is a member of the Task Team that issued the Annex 4 Report, see p. vii, and should have raised these contradictions as part of his contribution to the SEIS in order to meet NEPA's core objective of a full and fair analysis.

II. VIOLATIONS OF THE SANDUSKY RIVER TMDL's

10. The release of Ballville Dam sediment into the Sandusky River will pollute that river with sediment and the agricultural nutrients phosphorus and nitrogen compounds. Concurrently, the Sandusky River is on Ohio's impaired water list under Section 303 of the Clean Water Act (CWA) because its water uses are impaired by those same pollutants: sediment/siltation, phosphorus and nitrates plus nitrite. Because it is an impaired waterway due to these pollutants of concern, Ohio EPA prepared a Total Maximum Daily Loading (TMDL) Report pursuant to Section 303(d) of the CWA for the Lower Sandusky River that was finalized on May 28, 2014, and approved by U.S. EPA on August 11, 2014. The report is available at: http://www.epa.state.oh.us/dsw/tmdl/SanduskyRiver.aspx#122016470-tmdl-report.

    This Report establishes TMDLs for the Sandusky River that set the maximum amount of a pollutant that may be discharged without causing the receiving body of water to violate water-quality standards. 22 USC 1313(d)(1)(C). To meet those standards, the Report finds "Reductions on the Sandusky River (lower) main stem for total phosphorus ranged from 30 percent to 60 percent; nitrate plus nitrite, 28 percent to 74 percent; and TSS, 20 percent to 89 percent." These reductions have real teeth because they are tied to waste allocations in designing water permit limits and NPDES Discharge Permits issued on the Sandusky River must include limits that are "consistent with the assumptions and requirements" set forth in the TMDL, 40 CFR 122.44(d).

    The Sandusky River TMDLs will be violated by the release of the Ballville Dam sediment thereby in turn violating the Clean Water Act. Because the Sandusky River TMDL Report is a leading source of critical data on the health of the Sandusky River and a major component of the nation's Clean Water strategy, it is surprising to the Sierra Club that this Report, and its conclusions regarding the already serious problems that the Sandusky River has with sediment and agricultural nutrients, is not mentioned in either the EIS or the SEIS. The EIS, as currently constituted in isolation from the Sandusky River TMDL Report and failing to consider its results, is unlawful and cannot be approved. Accordingly, the SEIS must be amended to account for the Sandusky River TMDLs and demonstrate how its recommended action will be consistent with this important federal program and minimizes the harms that the TMDL report identifies.

III. VIOLATION OF STATE WATER QUALITY STANDARDS

11. In addition to the federal TMDL process, the State of Ohio also has promulgated water quality standards protecting the state's surface waters from nutrient loads that will form nuisance growth of algae. The relevant standard is codified at Ohio Adm. Code Sec. 3745-1-04 that "to every extent practical and possible" all surface waters of the state shall be "(E) Free from nutrients entering the waters as a result of human activity in concentrations that create nuisance growth of aquatic weeds and algae." The Sandusky River is clearly not

complying with this standard as we again refer the Service to the conclusion of the Annex 4 Report that: "the cyanobacteria blooms that occur annually in Sandusky Bay start the earliest, last the longest, and reach the greatest algal cell densities of any in Lake Erie," at p. 38. By contributing additional nutrients to the Sandusky River through human activity, the relatively free release of sediment proposed in the SEIS contributes to the violation of this standard. As with the violation of the TMDL standards, the SEIS must be amended to take a hard look at this violation of the Ohio water quality standard and demonstrate how the recommended action will be consistent with its requirements and the policy that the standard is designed to accomplish.

IV. FAILURE TO ASSESS IMPACTS FROM SEDIMENT TRANSPORT TO THE FREMONT LEVEE AREA

One of the Sierra Club's primary concerns with the EIS is its failure to address the physical impacts (irrespective of its extent of contamination) that the release of the sediment will cause to the Sandusky River and its habitat values, especially to the prolific and locally famous fishing and spawning grounds for walleye and white bass immediately downstream from the Ballville Dam in the levee area of Fremont. This important issue received virtually no consideration in the narrative portion of the EIS. This issue of fish impacts generally in the full Sandusky River received only *a single paragraph's mention* in the EIS narrative in Section 5.3.3.2, at the top of p. 5-44, which states in toto:

> "Fish may be temporarily adversely affected by increased sediment loads and the subsequent physiological stress from high suspended sediment concentrations, feeding impairment, reproductive impairment, and changes to structural habitat quality (Appendix A11). However, these impacts appear to be temporary and recovery is generally underway or complete within three to five years."

This highly truncated, vacuous paragraph is then followed by four far lengthier paragraphs describing the long-term benefits of dam removal for fish habitat that will eventually overcome the admitted harm directly caused by the release of the sediment, regardless of how bad or unnecessary those initial impacts would be The Sierra Club agrees with the eventual long-term benefits described, but objects strongly to the failure of the EIS to properly assess and minimize the impacts from the sediment release which we believe are certain to be far more dire than whatever the vacuous paragraph quoted above is supposed to imply.

In short, the EIS focuses only on the long-term benefits of dam removal as eventually outweighing what it calls the "short-term" impacts of the massive sediment release, irrespective of what those impacts will actually be and how long they will actually endure, and irrespective of how those impacts could be minimized by removing the sediment before the Dam's demolition. This approach is illegal under NEPA. The Club sees the Service's overriding focus on these

long term benefits as a dodge designed to obscure the failure of the EIS to take a hard look at assessing and minimizing the admitted environmental effect of the release of the sediment. This initial dodge is then reinforced by a second dodge by which the release of the Ballville Dam sediment is compared to the overall sediment loads within the Sandusky River watershed, see SEIS p. 5-3, in what is apparently a pretense to avoid giving the Ballville Dam sediment the meaningful independent evaluation that NEPA requires. Ignoring the Ballville Dam sediment's impacts merely by pointing to other sources of harm in the watershed has no relevance to a proper NEPA impact analysis on this project, especially when the watershed as a whole is already impaired by excessive sediment and nutrients, see Section II on the Lower Sandusky River TMDL report. The SEIS makes no change whatsoever in this basic, underlying problem that violates the most basic requirements of NEPA.

The Sierra Club's concerns with sediment transport from the impoundment area into the fishing and spawning grounds within the levee area of the City of Fremont are established by the conclusions in the EIS and SEIS that a "sediment wedge" from 1 to 2.5 feet in depth will form in this fishing area following the Dam's removal, see SEIS 5.1.2.2, p. 5-7. The environmental documents contain several other references to sediment deposition predicted to follow the Dam's demolition, see e.g., that deposition would be 3/8" deep over a broader area, SEIS, p. 5-8. Due to this deposition and the accompanying increase in total suspended solids (TSS) within the River, the environmental documents and accompanying reports acknowledge that impacts from sediment transport will occur to the River and its fish, but do not quantify those impacts. The failure of the environmental documents to adequately consider these impacts on the Fremont fishing grounds give rise to the following comments:

12. We agree generally with the portion of the model used in the SEIS, p. 5-9, that the Ballville Dam sediment will be transported with little loss through the fast-moving, narrow, and very steep river passage with high rock walls immediately downstream from the Dam and that the water flow slows significantly upon reaching the flat, broader river segment in the levee area in Fremont itself. This flat, slower moving area between the levees in Fremont accordingly allows sediment to fall out of suspension and the "sediment wedge" to form there.

    The environmental documents seek to temper the extent of deposition possible within the levees by claiming that the lack of floodplain in the levee area nevertheless causes rapid stream movement to continue through the levee area. However, this theoretical claim does not withstand an abundance of local experience from residents of Fremont indicating that, in the actual location, the difference in flow between the rock wall area and the levee area is stark and the water flow in the levee area is far less rapid. Indeed, the moderate nature of the river in the levee area is a major reason for the popularity of the fishing and fish spawning area between the levees. We therefore disagree with the SEIS's over-reliance on the lack of floodplains in the levee area as minimizing deposition

to any decisive degree and thereby limiting the threat to the Fremont fishing and spawning grounds. This assertion should be removed from the SEIS unless it can be supported with empirical data and properly limited.

13. It is well accepted that sediment transport occurs is two different forms, suspension of sediment in the water column and bedload transport. The analyses and reports on which the Service's environmental documents rely do not refer to, nor appear to consider, bedload transport; i.e., they address suspended sediment transport only. Bedload is the portion of sediment transport that rolls, slides or bounces along the bottom of the waterway with the water flow. This sediment is not truly suspended as it sustains intermittent contact with the streambed. Bedload transport occurs when the force of the water flow is strong enough to overcome the weight and cohesion of the sediment but is not great enough to fully suspend it.[1]

    Bedload transport involves two differing types of sediment, larger stones or gravels that are difficult to suspend and aggragations (clumps) of smaller particles. The sediment in the Ballville impoundment is predominantly fine grained clays and silts. Based on the general properties of such particles and the pictures of the sediment provided by the City of Fremont to the Army Corps of Engineers for the SEIS, the sediment in the impoundment is viscous and is capable of bedload transport as aggragated clumps.

    Due to the factors described in the previous comment on the characteristics of local water flow, the bedload transport from the Dam area will accumulate in the Fremont area between the levees where it will bury the spawning grounds creating a substantial environmental impact not considered in the SEIS. Of particular concern, this bedload, as well as the sediment wedge formed by suspended sediment acknowledged in the SEIS, will embed the critical interstitial spaces in the substrates on the surface of the riverbed on which the current success of this fish spawning area depends, see following comment. For these reasons, the SEIS must be amended to address the potential impacts for bedload transport of the Ballville Dam sediment into the Fremont fishing and fish spawning grounds specifically.

14. As indicated in the prior comment, a major but unexamined impact from the sediment release is the issue of "embeddedness," i.e. the degree to which finer sediments surround coarser substrates on the surface of a streambed. This consideration is important as

[1] This information is condensed from a sediment transport textbook Southard, J., Introduction to Fluid Motions, Sediment Transport, and Current-Generated Sedimentary Structures, Course Textbook, Massachusetts Institute of Technology. Retrieved from http://ocw.mit.edu/courses/earth-atmospheric-and-planetary-sciences/12-090-introduction-to-fluid-motions-sediment-transport-and-current-generated-sedimentary-structures-fall-2006.

embeddedness fills the interstitial spaces that are the primary habitat for benthic organisms and recently hatched fish. Filling these interstitial spaces results in reduction of egg and embryo survival, egg to embryo emergence, and fry size, while also impacting living space and regeneration for macroinvertebrates necessary for general stream health and food for fish communities, especially their young.

None of the studies supporting the EIS consider the issue of embeddedness nor does the EIS or SEIS. As the SEIS acknowledges that a sediment wedge will be formed between the levees and then move downstream through their extent, the SEIS already concedes that some degree of embeddedness will occur in the Fremont spawning grounds causing a direct but unexamined environmental harm. This harm from the wedge is increased by the additional deposition caused by the unexamined issue of bedload transport. Once these interstitial spaces are buried by sediment, recovery may be very long term, if at all, because the slower river speed in the levee area segment is unlikely to flush those spaces clean of sediment. Restoring the interstitial spaces of the spawning beds in this location would likely require physical removal of the sediment at considerable expense, such as through the use of suction devices. For these reasons, the SEIS must be amended to address the potential impacts of embeddedness that will be caused to the Fremont fishing and fish spawning grounds.

15. The SEIS does not include consideration of the danger of extreme sediment transport affecting the Fremont fishing grounds as a result of storm activity that directly imparts its physical force into the impoundment area following the demolition of the Ballville Dam. The study on which the SEIS relies, the Stantec 2011 report on sediment transport, Appx. D of the 2011 Feasibility Study, considers high and low flow years for the Sandusky River, with a maximum safety factor of 10, in evaluating the transport of sediment from the impoundment. The only storm effect considered by this methodology is the indirect consideration of greater storm frequency during high flow years by storms occurring anywhere within the extremely large Sandusky River watershed that contribute rainwater by run-off upstream of the Dam. While these non-local storms cause higher water flows that mobilize a greater quantity of sediment from the Ballville Dam impoundment, this is a different and more limited consideration of storm effects than that arising from a local storm that creates kinetic energy impacts focused on the area of the impoundment itself through the physical impact of rain directly on the impoundment and through increased wind and wave motion.

    A great concern to the Sierra Club for the Fremont fishing grounds arising from the Dam removal as recommended in the SEIS is that a major storm event will directly strike the impoundment area after the Dam is substantially demolished, causing far more sediment

to mobilize toward the Fremont fishing grounds due to the storm's direct kinetic energy than that considered in the 2011 analysis and far exceeding that study's safety factors. The environmental documents do not address this scenario. The SEIS should be amended to address this danger through modelling and significant increases in safety factors.

16. The SEIS does not predict the level of Total Suspended Solids (TSS) caused by the sediment released from the Ballville Dam, even though that level is clearly related to determining the impacts on aquatic organisms and is capable of calculation. We refer the Service to a very thorough study of aquatic impacts from the removal of four dams on the Klamath River in Oregon and California: Stillwater Sciences. 2009. Effects of sediment release following dam removal on the aquatic biota of the Klamath River. Technical report. Prepared by Stillwater Sciences, Arcata, California for State Coastal Conservancy, Oakland, California. January. 185 pp. Although impounding a greater overall quantity of sediment than the Ballville Dam and addressing impacts on salmonids, the sediment involved is also fine grained, making this study's results applicable here. This excellent study is not referenced in any of the materials supporting the Service's environmental documents.

    The study concludes that TSS presents the main danger to fish populations and extensively reviews studies documenting impacts at various concentrations, both short and long term. It concludes:

    > "it appears that relatively short-term exposures to increases in TSS concentrations under 500–600 ppm would not likely result in substantial direct mortality to either juvenile or adult anadromous salmonids in the Klamath River. If the duration of exposure is extended, however, some direct mortality may be expected. Exposures of 19 days to TSS concentrations of 90–270 ppm and higher have been reported as resulting in mortality to juvenile rainbow trout," p. 10.

    As to impacts on spawning, it concludes:

    > "Egg-to-emergence survival of salmonids spawning downstream of the Iron Gate Dam site may be substantially reduced by fine sediment settling out of the water column and into substrates. [i.e., embeddedness, see Comment 14 above]. Extended exposures to suspended sediment have been reported to result in significant mortality to eggs of salmonids at concentrations of less than 200 ppm. P. 10.

    This result on egg mortality is further amplified on page 20 under circumstances similar to what is predicted in the SEIS to occur in the Fremont levee area:

> "For this analysis, impacts on incubating eggs of mainstem spawners are assumed to be lethal. The sediments released during dam removal will likely be primarily conveyed as wash load and will not fall out of suspension; however, that fraction of sediments that intrude into the spawning gravels will carry high concentrations of very fine sediment. It is possible that these sediments will adhere to the chorion of the egg (Greig et al. 2005, Levasseur et al. 2006) and smother and kill the eggs."

In order to act on the significance of these findings, the report calculates the predicted levels of TSS utilizing the Dam Removal Express Assessment models developed for simulation of sediment transport following dam removal (Cui et al. 2006a, 2006b); the results of this modeling are presented on Tables 1 to 4 on pgs. 3-6. Based on these predictions, the report concludes that there would be substantial impacts on the six focal species studied and then utilized these results to determine means to minimize impacts.

No comparable TSS predictions have been made in the Service's environmental documents or supporting studies for the Ballville Dam sediment release. For the reasons stated in the Klamath River report, such a calculation is fundamental to determining the effects of the sediment release on the Sandusky River and the aquatic biota there. Further, the modelling to make this calculation have been available for a decade. The SEIS should incorporate predicted TSS values and undertake a minimization analysis similar to that undertaken in the Klamath Report in order to comply with NEPA.

17. The Klamath River study essentially concludes that TSS from the released sediment would cause such serious impacts in the short term that, unless the fish avoided the Klamath River main stem, mortality effects could be as high as 60%, p. iii. The most positive conclusion was that the fish species examined would not be eliminated entirely, but primarily because they could leave the main stem for suitable tributaries that were capable of supporting the fish and their spawning needs if those tributaries were properly prepared. See pages iii-iv stating:

> "However, despite these predicted impacts, complete mortality is not expected for any species or life stage. The primary mitigating factor is that all species analyzed have extensive temporal and spatial distribution within the basin, which is expected to facilitate survival during dam removal, and a strong recovery subsequent to dam removal. In particular, the use of tributaries for spawning and rearing, the use of other off-channel habitat for over-wintering, rearing in the lower river or estuary, and life histories that include mature adults in the ocean, is predicted to buffer the short-term impacts of TSS in the mainstem.

Based on this conclusion, the Report recommended a minimization technique of improving habitat quality in these tributaries before allowing the sediment release, including efforts in tributaries that increase instream flows, reduce sediment input, increase habitat complexity, and remove migration barriers.

Two important conclusions arise from this Study for the Fremont fishing area. First, its spawning grounds will be impaired and its target fish species likely driven away by TSS but the extent of that harm is unknown and has not been considered in the SEIS. In light of the Klamath Report's findings, it is apparent that there will be significant damage to the spawning grounds and significant economic loss to the Sandusky County economy due to reduced fishing in the Fremont fishing grounds which must be evaluated pursuant to NEPA.

Second, the role of the Sandusky River's tributaries is likely critical to the eventual restoration of the Fremont fishing grounds, but the suitability of those tributaries, especially their ability to supply a replacement spawning capacity, has not be evaluated. As this was the primary mitigating factor for the Klamath River, the capacity of these tributaries (as well as Sandusky Bay and Lake Erie, as appropriate) should be evaluated as a necessary means to minimize the harm caused by the release of the Ballville Dam sediment.

VI. FAILURE TO CONDUCT A LAWFUL COMPARISON OF ALTERNATIVES DUE TO THE LACK OF MEANINGFUL CONSIDERATION ON THE COSTS OF SEDIMENT REMOVAL.

18. The EIS fails to consider any sediment removal alternative based on a single, flawed cost estimate (Appx. A-2) addressing only the hydraulic dredging of sediment from behind the Dam. Based on this faulty study, the EIS rejects from detailed consideration all other sediment removal alternatives raised in public comment, even those not using hydraulic dredging, leaving as the only alternatives remaining for full consideration those with just minor variations in the relatively free release of the sediment at the heart of the recommended alternative.

    The EIS does this by improperly applying the NEPA rule that allows "unreasonable" options to be "eliminated from detailed study," 40 C.F.R. 1502.14(a), by using the cost "study" at Appx. A-2 to arbitrarily claim that any means to manage the waste other than its simple release as proposed in the EIS is cost prohibitive. As a result, the range of alternatives considered is too narrow to meet the breadth necessary for a valid NEPA review. This violation is then further compounded by the Service's violation of the NEPA requirement of fair response to valid public comments recommending additional removal alternatives.

This dredging study (Appx. A-2) is 10 pages long of which only 3 pages (pgs. 7-9) address cost issues. The study's instantly obvious flaw is that all of its cost estimates are based on "another dam removal project currently under construction in Michigan" that is never identified or described in any detail, rendering any reasoned comparison to the Ballville setting impossible. There is not even information on the size of the Michigan project so that even basic economies of scale are also impossible to consider. No supporting documentation is supplied to validate the bare "cost estimates" presented or to show that they are reasonable for the industry.

The estimate is divided into a "partial" option removing 200,000 cubic yards of sediment and a "full" option removing 800,000 cubic yards, with each step in the process then assigned separate costs. Again, no verification is provided for any of these costs; indeed, based on what is provided, these cost values could have been plucked out of the air. The first cost given in A-2 is for the hydraulic dredging itself (the only removal option considered) at $80 per cubic yard; then 2) dewatering of the wet dredged sediment at $20 per cubic yard; 3) loading and transporting the sediment at $8.27 per cubic yard, and the final step 4) given as disposal in a specially constructed landfill exclusively for the dam's sediment at a cost of $30 per cubic yard for or the "partial" and $9.50 per cubic yard for the "full disposal." The appendix concludes (p. 9) that the cost for "full" dredging is over $93 million or over $116 per cubic yard and for "partial" dredging at over $26 million or over $130 per cubic yard.

This cursory, unsubstantiated and unverifiable study is insufficient *on its face* to constitute a hard look at the costs of all sediment removal alternatives as the Service used it in the preparation of the EIS, let alone those only involving hydraulic dredging.

The cost estimate in Appx. A-2 is also directly contradicted in the record. The same contractor that drafted Appx. A-2 had previously undertaken a "Feasibility Study" for the City of Fremont on the Ballville Dam removal in 2011 that is frequently relied upon throughout the EIS.[2] This previous Study fleetingly considered a sediment removal alternative (p. 73) *in just five sentences of text* which concluded that: "The cost to hydraulically dredged [sic] only 10 percent of the impounded sediment would be more than $2 million *($25 per CY)."* This $25 cost estimate is less than a third of the $80 dredging cost the same contractor asserted in Appx. A-2 just two years later.

The blanket rejection of all sediment removal options in just five sentences without supporting documentation in this initial study by the same consultant that prepared Appx.

[2] available at the City of Fremont's web-site at: http://www.egovlink.com/public_documents300/fremont/published_documents/2011%20Ballville%20Dam%20Feasibility%20Study/Ballville%20Dam%20Feasibility%20Study%20October%202011.pdf.

A-2 clearly demonstrates the arbitrary and capricious approach taken on this critical topic of the cost of sediment removal. This initial superficial approach actually became worse in the subsequent Appx. A-2 with its unexplained, massive increases in dredging costs. Both of these documents demonstrate a completely dismissive, predetermined decision to reject all sediment management alternatives other than open release without a serious look at the underlying economic realities involved.

Looking outside the administrative record establishes that even the undocumented $25 per CY dredging cost of the 2011 Feasibility Study is inflated based on data from the ACOE's database of contracts for dredging operations nationwide (the Dredging Information System which is part of the Corp's Navigation Data Center at http://www.navigationdatacenter.us/db/dredging/contract/). This database contains information on six Ohio dredging operations during 2014 (Entry numbers 2319-2325) with dredging cost from $9.11 to $3.66 per cubic yard.

In addition, Appendix A-2 is flawed in its use of an extremely expensive, specially constructed landfill for sediment disposal as the only disposition option. The Appendix states that this restricted evaluation is based on two wholly unsubstantiated assumptions: 1) that a special landfill is needed because "there are no areas that can store or utilize the sediment" and 2) "it is not likely that an existing landfill will accept" the sediment. Based on these unsupported assumptions – the first of which was directly contradicted by subsequent public comment, see Comment 20 below – beneficial reuse options for the sediment that could have avoided landfilling and significantly reduced costs were never considered.

Finally, another alternative raised in public comments, the "bypass/excavation" alternative, discussed below, would have completely saved the $20 per CY dewatering charge of Appx. A-2 and would have radically reduced costs for sediment removal compared to hydraulic dredging. As discussed in the next comment, this alternative also was not given a substantive response.

It appears incontestable on the face of these documents (and the Service's failure to respond to comments recommending alternatives), that the cost issue was manipulated and predetermined in the EIS in order to avoid detailed consideration of viable sediment removal alternatives. The SEIS does not improve this problem in the slightest. The Sierra Club's October 16, 2016, letter raised these deficiencies, but the SEIS ignores them. Instead, it would deflect the issue of the cost study's flaws entirely by simply insisting that no costs for sediment management alternatives need to be determined and evaluated because of the lack of "long-term impacts" from the free release of the sediment, SEIS, p. 2-2. This is not an adequate response under NEPA when substantial impacts are admittedly created by the sediment's free release, at least in what the SEIS calls "the short term." There cannot be a meaningful consideration of alternatives

consistent with NEPA when all meaningful alternatives to the free release of the sediment are rejected from detailed consideration at the onset on the basis of a deeply flawed analysis, especially when that analysis relates only to a completely different alternative (hydraulic dredging) that no public comment is advocating. Accordingly, the Final SEIS must incorporate a new cost analysis for sediment removal options, including the bypass/excavation and reuse options discussed below in addition to hydraulic dredging, to satisfy NEPA's requirement to provide meaningful consideration for all viable alternatives.

VII. FAILURE TO ASSESS THE PROPOSED BYPASS/EXCAVATION OPTION

19. The bypass/excavation alternative mentioned in the previous comment was raised in public comment on the draft EIS by C. Collins, at EIS, Appx. B, p. 17. The comment expressed concern that the release of the Ballville Dam's stored sediments would result in considerable impacts on the Sandusky River's bivalves and macroinvertebrates through burial, contaminants, abrasion and habitat elimination. To address this concern, the commenter recommended consideration of an option that a channel be built around the dam to allow the impoundment to drain while preventing the sediment from moving downstream. The comment noted that this option had been successfully employed at dam removals in other states. In the Service's response to this comment, however, it simply cited the inflated cost estimate report in Appendix A-2 even though the hydraulic dredging option addressed there had little in common with the commenter's recommendation. This constitutes an unlawful failure to respond under NEPA

    This alternative is very similar to a proposal presented to the Fremont City Council's Utilities and Traffic Committee on November 6, 2014, by employees of Streamside Technology, LLC, of Findlay, Ohio, a firm specializing in stream remediation work, including sediment removal. This presentation, including a lengthy question and answer period, lasted for over an hour on the issue of the proper management of sediment in river environments to prevent the burial of riverbeds that could impair its habitat values for an extensive number of years. The presentation also included a detailed description of the bypass/excavation option as the best alternative to this problem, which is summarized as follows:

    a. Construct a bypass channel and gating system around one side of the Ballville Dam to fully control the discharge rate from the impoundment, both during the dewatering of the impoundment and during storm events, to keep the discharge below the rate that would mobilize the sediment. The bypass would allow the sediment within the impoundment area to naturally dewater and dry out. In this manner, this alternative would avoid the cost of "dewatering" the sludge stated in Appendix A-2 at $20 per cubic yard.

b. Once the sediment has naturally drained, it would be removed by using standard excavation techniques, i.e., earth-moving equipment, at a cost dramatically less than the $80 per cubic yard given for hydraulic dredging stated in Appx. A-2. Removing the sediment in this manner has the substantial benefit that its organic material is removed from the downstream environment unlike in the EIS where it will be re-suspended within the Sandusky River. Removing this organic material prevents high river turbidity (i.e., TSS), the clogging of habitat, and eutrophication while providing a higher value for beneficial reuse in engineered soils or products.

c. Once the sediment is removed, its primary end usage would be selling it for beneficial reuse to offset, at least in part, the cost of its removal. Costs recovered from beneficial reuse of recovered sediment range from $10 to $15 for higher quality sand to $6.00 and $10.00 for reuse in agriculture or for structural fill material. These costs may be affected by the level of contamination in the sediment and the amount of treatment made necessary thereby for its reuse.

d. An option is that any residual sediment escaping from the impoundment could be collected in collector devices placed on the river bottom downstream of the dam site to further minimize sediment impacts. Such a collector could also be utilized at the gate of the by-pass channel to collect any sediment released from that source during the dewatering period.

It is readily apparent that, if the mobile sediment is removed in this manner, the dam can be demolished with far less sediment loss downstream, making it an effective alternative for minimizing impacts. Also, several of the costs provided in flawed Appx. A-2 would be either eliminated or significantly reduced, especially once the income resulting from the beneficial reuse of the sediment is taken into account.

It was unlawful for the EIS to fail to give detailed consideration to this viable alternative raised in comment, especially in the manner in which it was summarily dismissed on the basis of the flawed and irrelevant cost estimates in Appx. A-2. The draft SEIS now mentions this bypass option in Section 2.2.2, pages 2-4 to 2-5, after it was stressed in the Sierra Club's letter of October 16, 2015, but the SEIS does not give it meaningful consideration. The draft SEIS acknowledges the successful use of this option at a dam removal in Montana, but then refuses to consider it by invoking a new expedient that the lack of "long-term risk" to the Sandusky River alone makes any alternative involving sediment removal unnecessary, irrespective of what it may cost, SEIS, p. 2-5. Rather than assess the costs involved for the bypass option, the SEIS instead makes a completely arbitrary assumption that it is "reasonable to assume they (the costs of the bypass/excavation option) would be at least as much as the cost estimates for dredging the impoundment," SEIS at p. 2-5. This statement inexplicably ignores the multiple inherent cost savings in the bypass option over hydraulic dredging described above.

These reasons for failing to give detailed consideration to the bypass/excavation that would eliminate virtually all of the impacts from the release of the Ballville Dam sediments are arbitrary and capricious. Because the bypass/excavation alternative is a viable alternative with major environmental benefits over the recommended action, NEPA requires that this alternative receive detailed consideration in the final SEIS.

VIII. FAILURE TO CONSIDER BENEFICIAL REUSE OF THE SEDIMENT

20. Beneficial reuse of the sediment as a means to minimize impacts and reduce costs was not considered in the EIS; instead the very expensive option of a dedicated landfill was the only disposition option considered in Appx. A-2. The desirability of considering beneficial reuse of the nutrient-rich sediment was raised in a comment to the draft EIS from U.S. EPA, EIS, Appx. B, p. 59, Comment 18, requesting that the FWS address "how a decision was made to release sediments downstream versus excavate them for beneficial reuse or for proper upland disposal."

    As this comment came from a federal agency with substantial expertise in water quality and habitat issues, this comment was entitled to deference and serious consideration by the Service. Instead of deference, however, this comment was given no real response at all. Exactly like the arbitrary rejection given the comment recommending the bypass/excavation option, the Service's response merely instructed U.S. EPA to read the inflated dredging estimate in Appx. A-2, see EIS, Appx. B, p.69. The arbitrary nature of this response is especially obvious given that A-2 failed to mention beneficial reuse at all.

    The record therefore establishes that the Service has committed an unlawful failure to respond to comment under NEPA. This second use of the flawed A-2 study to reject consideration of an alternatives other than the relatively free release of the Ballville Dam sediment is the basis for the Sierra Club's statement in Comment 18 that "the cost issue was manipulated and predetermined in the EIS in order to avoid detailed consideration of viable sediment removal alternatives."

    Further, as noted above, Appx. A-2 contained an unsupported, explicit assumption that an expensive dedicated landfill was necessary because "there are no areas that can store or utilize the sediment." A comment in the ROD, Appx. A, p. 7, directly contradicts this assumption. The comment was from a commercial recycling facility ("Universal Farms LLC") located just a mile from the Ballville Dam expressing its interest in taking the dam's sediment to process for future sale. This comment received no substantive response and did not lead to any assessment of this clear opportunity for beneficial reuse and greatly minimized environmental impacts. The Service's neglect of the Universal

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Farms offer constitutes another unlawful failure to respond to public comment under NEPA.

Accordingly, both the comments of US EPA and Universal Farms LLC should receive full and complete responses in the Final SEIS. In addition, because beneficial reuse of river sediment obtains from $10 to $15 per cubic yard for sand or from $6 to $10 for use in agricultural or as structural fill, see prior Comment, beneficial reuse therefore substantially offsets the cost of sediment removal and can make a well-designed sediment removal alternative, such as bypass and excavation, viable and far superior to the relatively free release strategy recommended in the Service's environmental document. A new cost estimate taking reuse into account is therefore necessary for NEPA compliance.

The Sierra Club appreciates this opportunity to comment on the Draft SEIS and work with FWS to insure NEPA compliance in the Ballville Dam removal project that will allow the project to proceed with a fully considered and truly minimized environmental impact. Obviously, we believe that the Draft SEIS must be substantially revised to meet this goal. We look forward to reviewing your substantive responses to these comments and are willing to meet with FWS staff and those of other agencies that you consider helpful in reviewing these important issues. The Sierra Club believes that removing the Ballville Dam with the least possible environmental harm to the Fremont fishing and spawning grounds, the Sandusky River, the Sandusky Bay, and Lake Erie is a worthy goal and remains willing to continue its efforts to achieve that result.

Sincerely,

Richard C. Sahli
Attorney for the Sierra Club